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POLICY RESEARCH WORKING PAPER 2731

An Alternative Technical Education System in Mexico

A Reassessment of CONALEP

Gladys López-Acevedo

The results of this paper appear to indicate that CONALEP is a highly cost-effective program. CONALEP has had spillover effects on the rest of the technical education system in Mexico by stimulating other educational institutions to be more efficient.

The World Bank
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Summary findings

Using matched pair methods, López-Acevedo reevaluates the labor market performance of graduates of Mexico's Colegio Nacional de Educación Profesional Técnica (CONALEP), the country's largest technical education system. She also assesses the impact of innovations introduced by CONALEP in 1991.

The analysis shows that individuals in the control group find jobs faster than CONALEP graduates do, but a larger share of CONALEP graduates work in an occupation consistent with their field of specialization or training. CONALEP graduates earn 20–28 percent more than the control group. And employers invest more in training CONALEP graduates than they do in training individuals in the control group.

López-Acevedo shows that the innovations introduced by CONALEP increase graduates' probability of finding a job and shorten their job search. A cost-benefit analysis appears to show that CONALEP is an effective training system.

This paper—a product of Poverty Reduction and Economic Management Sector Unit, Latin America and the Caribbean Region—is part of a larger effort in the region to reduce poverty and inequality through human capital investment. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Michael Geller, room I4-046, telephone 202-458-5155, fax 202-522-2112, email address mgeller@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at gacevedo@worldbank.org. December 2001. (74 pages)

An Alternative Technical Education System in Mexico :

A Reassessment of CONALEP

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Acronyms

CBET	Competency Based Model
CECATI	Non-professional, Elementary Vocational Training
CENEVAL	Centro Nacional de Evaluación
CONALEP	Colegio Nacional de Educación Profesional Técnica
CONOCER	Council for Standardization and Certification of Labor Competencies
COSNET	Council of the National System of Technological Education
DGETI	Technical-professional schools
EAP	Economically Active Population
ENE	National Employment Survey
ENECE	National Employment, Training, and Salary Survey
ENEU	National Urban Employment Survey
NAFTA	North American Free Trade Agreement
OECD	Organisation for Economic Co-operation and Development
PMETyC	Education Modernization Project
SEIT	Under Ministry for Technological Education and Research
SEP	Ministry of Public Education
SESIC	Under Ministry for Tertiary Education and Scientific Research
STPS	Ministry of Labor

I. Background

The period spanning from the second half of the 1980s until the late 1990s is important for the Mexican economy, as it encompasses a major structural change from a protected, public-sector driven economy to a globally integrated, private-sector led one. For all its merits, this change seems to have produced an increasingly unequal distribution of the fruits of economic growth. The World Bank Report "Earnings Inequality after Mexico's Economic and Educational Reforms" (2000) showed that the most plausible hypothesis for the worsening in earnings inequality in Mexico is the increased rate of skill-biased technological change brought about by trade liberalization. This World Bank Report also found that Mexico is experiencing increasing returns to higher education, and that the skill composition of employment in manufacturing and other export sectors has moved toward demanding a higher proportion of skilled workers, particularly in industries that are most open to international competition.

When rising demand for skills is not met by supply, the result is a persistent shortage of skilled labor and constrained growth. The excess demand also forces firms to pay above market-clearing wages in order to retain the workers they train. On the supply side, the roots of the shortage problem can be traced to three main factors. The first is low educational attainment—particularly among the poor. The second is insufficient financial support to those students who are academically qualified but who are financially needy. The third is the persistence of antiquated and unresponsive training mechanisms—vocational and technical systems are not providing new entrants with appropriate skills.[2] Effective technical training is Mexico's primary tool for reaching an equilibrium in the market for skilled labor.

[2] Evidence on the low educational achievement in technical education is drawn from the Council of the National System of

Several attempts have been made to evaluate technical education programs in Mexico.[3] Using a rigorous impact evaluation method, this paper re-examines the performance and evolution of the College of Professional Technical Education (CONALEP) system. CONALEP is the backbone of Mexico's skills training structure and has become the most important government technical education system.

This paper is organized as follows. Section II reviews briefly the Mexican labor market. Section III describes the Technical Education System in Mexico and the place of CONALEP within this system. Section IV discusses the evolution of the CONALEP system. Section V reviews CONALEP's past evaluations. Section V also introduces the CONALEP graduate tracer survey, the National Employment Survey (ENE), and the National Employment, Training, and Salary Survey (ENECE) used in this study. Section VI discusses the CONALEP benefit results compared to a well-designed control group. Section VII discusses the CONALEP benefits of the reformed program (the introduction of the modular course, among others). Section VIII presents the cost-benefit analysis. Section IX offers conclusions. The annexes at the end of this paper include the most relevant quantitative results that support the paper's findings.

II. The Labor Market

Crisis and change have marked the past twenty years of Mexico's economic development. Many crises have had important impacts on labor markets. In the early 1980s,

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Technological Education (COSNET). This Council applies other tests in the SEIT schools to measure students' formal reasoning and the ability to learn mathematics. In addition, each institution designs its own proficiency examination. The "technological" area uses as criteria 7 points in the learning examination (in a 0 to 10 scale), a minimum of 18 correct answers out of 32 in the over-all knowledge examination and 12 correct answers out of 24 in the test to assess capacity for learning mathematics. SEP, in the "Informe de Labores 1997-1998," reports that 234,925 students took this exam. Of them 3,231 (1.3 percent) were rejected from upper-secondary education, not having the knowledge and capacities for entry requested by the educational institutions.

[3] See World Bank, 1997, *Mexico: Training Assessment Study*. Carnoy B. et. al., 2000, "Aprendiendo a trabajar: Una revisión del Colegio Nacional de Educación Profesional Técnica y del Sistema de Universidades Tecnológicas de México."

Mexico and the rest of Latin America plunged into a major recession, brought on by over-borrowing in the 1970s as a result of extremely low real rates of interest, and by excessive reliance of some countries on oil as an export commodity. When the United States drastically increased interest rates to fight its own inflation, Latin America and other developing countries were caught with high foreign debt to gross national product (GNP) ratios and major interest repayments. Moreover, the steep decline in oil prices worsened the crisis for Mexico and other oil exporting countries (World Bank 1998, 1999a).

The economic downturn in the early-1980s increased underemployment rates and lowered real income and wages sharply. The crisis also ended Mexico's (and Latin America's) import-substitution industrialization and forced the restructuring of Mexico's economy. The debt crisis and restructuring turned Mexico's manufacturing and agriculture sectors toward exporting and away from a protected domestic market. Mexico's average economic growth rate in the period 1959-1981 was about seven percent annually, or approximately four percent per capita. However, from the slow-down in 1983 onwards, growth rates have been much lower, about 2.6 percent annually (a 0.3 percent per capita growth rate). Nevertheless, in the past four years (1997-2001) the rate of economic growth has increased to five percent annually, or three percent per capita.

The peso crisis of 1994 was no different. The crisis caused sharp rises in unemployment, a slowing of employment growth, and a drop in real wages. Real wages did not return to 1985 levels until 1998. Large numbers of workers moved to the informal sector and to rural areas, with establishments of fewer than six employees growing by 6.3 percent in 1995 and establishments of more than six employees growing by only 0.6 percent (World Bank 1999b). At the same time,

the North American Free Trade Agreement (NAFTA) led to a rapid growth in export industries—Mexico had US$21.5 billion growth in exports from 1994 to 1998, compared to just US$6 billion in export growth from 1991 to 1994 (World Bank 1999).

According to the latest available national employment survey (ENE99), the economically active population (EAP), defined as the sum of the employed population and the open unemployed population, numbered nearly 40 million people. The average net participation rate was nearly 56 percent. From 1995 to 1999, the open unemployment rate decreased from 4.7 percent to 1.7 percent.[4] Mexico's labor force grew at an average rate of 2.8 percent per year from 1995 to 1999. This means that nearly 1,113,000 new entrants were added to the labor force every year.

Women's labor force participation, while still low compared to the level in developed economies, rose significantly in the 1990s. Data from the Organisation for Economic Co-operation and Development (OECD) shows that the rate for women 25-54 years old increased from 37 percent in 1990 to 44 percent in 1998 (OECD 1999). The other important feature of the late 1990s, according to the International Labour Organisation (ILO) data, is that labor force growth and declining open unemployment were accompanied generally by rising real salaries and wages in manufacturing. This was after a more than 30 percent decrease in real manufacturing wages from 1982 to1988.

[4] Mexican wages are likely to increase in real terms for the third consecutive year in 2000, by three to five points above inflation. The improvement fits with the pattern of booming economic growth in Mexico in 2001, coupled with a steady curbing of inflation. The latest government figures show that the economy grew by 7.5 percent during the first seven months of the year 2000, compared with 3.7 percent in the whole of 1999. Twelve-month accumulated inflation was down to 9.10 percent at the end of August, compared with 12.3 percent at the start of the year. Nevertheless, experts agree that, with inflation under control, wage increases during 2001 must be backed by increases in productivity in order to prevent a renewed increase in inflation.

The private sector accounts for about 88 percent of total employment in Mexico, a much larger share than that prevalent in other OECD countries. The Mexican private sector shows a growing duality: a large traditional sector coexisting alongside an expanding modern sector. The former, which consists primarily of micro-enterprises and small and medium-size enterprises (defined to include firms with up to 250 workers), employs a large fraction of the labor force but accounts for a small portion of output and exports. Roughly, these enterprises account for 71 percent of total employment, 53 percent of employment in manufacturing, 95 percent of employment in the retail sector, and 73 percent of employment in services.

From 1988 to 1996, annual output per worker was low in the service sector. While some studies have shown that the manufacturing sector has become more efficient as a result of trade liberalization, with gross labor productivity increasing at an annual rate of 3.1 percent during the 1988 to 1996 period, this rate was still low compared with that in other developing countries, and was about the same as in the United States (World Bank 1998).

One plausible explanation for this slow growth in labor productivity is the lower educational level of Mexican workers and the resulting deficiency in the on-the-job human capital accumulation compared to elsewhere. The increase in wages associated with an additional year of work experience for Mexican men is low compared to the increase for men with similar educational attainment in other countries (3.8 percent in Mexico compared with 8.1 percent in United States, 8.4 percent in Japan, and 9.1 percent in France). This rate is low even when compared with the rate in countries at a similar level of development and with comparable education indicators, such as Brazil (6.2 percent) and Colombia (5.8 percent). Given the well-documented correlation between wage growth, on-the-job training, and productivity observed in

many countries, these differences are consistent with the hypothesis that in Mexico post-school investment in human capital results in lower productivity growth. The observed low level of investment in human capital could also be explained by the incentive structure of labor regulations. In practice, as has been well-documented, firms appear to enjoy more flexibility than a strict interpretation of the law would suggest (World Bank 1999b).

III. Education and Training

The structure of Mexico's educational system has the following main characteristics. Basic education is the Mexican government's highest priority. The basic education system consists of: a) early childhood education (or pre-school), which is optional for children from 3 to 5 years old; b) mandatory primary education, ideally for children aged 6 to 12, but due to late enrollment and grade repetition it is targeted at children aged 6 to 14, and c) mandatory basic secondary school education, consisting of a 3-year cycle, and intended for children aged 12 to 16.

Upper-secondary education in Mexico is divided into a) *bachillerato general* (general baccalaureate), b) *bachillerato técnico* (technical baccalaureate) and c) *bachillerato bivalente* (bivalent baccalaureate). The *bachillerato general* education system is administered by the Sub-secretariat for Tertiary Education and Scientific Research (SESIC), while the technical baccalaureate system is administered by the Sub-secretariat for Technological Education and Research (SEIT) (OEDC 1997).

The *bachillerato técnico* training is provided through a range of institutions that include CONALEP, offering programs aimed at mid-level careers in the work force. Students graduate

with the qualification of professional technician, technical professional, or base level technician, depending on the type of institution they attend and the program they undertake. CONALEP is unique in that it offers the opportunity for students to gain access to higher education as they can opt to take more courses per semester and to take a separate high school diploma exam.

The *bachillerato bivalente* training institutions also offer the opportunity to study for a technical middle level career, while at the same time qualifying students for entry to higher education. Programs in this stream are available in the areas of agriculture, fishery, manufacture, and services. The complexity of the arrangements at the upper-secondary level are readily seen in Table A1.1.

In a parallel way, the national education system also offers skills training programs in a formal classroom format, with courses ranging from a few hours to several months. These courses have no academic prerequisites and provide job skills training for entry-level technical positions (*Capacitación para el Trabajo*). Most students in these training programs have a primary education background. The system also covers adult education, including non-traditional job skills training, self-instructional formats, special education, education for indigenous and rural populations, and open education at all levels.

Training in Mexico is given at four levels: a) job skills training with no formal academic requirements, b) upper-secondary level training which requires middle school to have been completed, c) undergraduate university level training, and d) graduate level training.

The Mexican educational system expanded rapidly at the secondary and university levels even during the economic crisis years of the 1980s and early 1990s (OECD 1997). In the 1990s,

the total number of students at primary level hardly rose at all, increasing from 14.4 million in 1990-91 to just 14.6 million in 1998-99. Yet terminal efficiency, the percentage of students finishing sixth grade with the group they started school with, increased from 70 percent in 1990-91 to 86 percent in 1998-99. Basic secondary education has expanded very rapidly in the past 20 years, increasing from three million students in 1980-81 to more than five million in 1998-99. In 1980, only 58 percent of 13-15 year-olds were in basic secondary school; in 1998-99, 80 percent of that age group were enrolled. Even so, dropout rates continue to be high (and they are still rising) at the basic secondary level, so that despite basic secondary being compulsory, at the end of the 1990s only 65 percent of 18 year-olds had completed basic secondary (SEP 1999a). These data include both rural and urban areas. In urban areas, the dropout rates are higher than in rural areas. Besides the rapid expansion of basic secondary in the 1980s and 1990s, the key change in Mexican education in the past two decades has been the rapid increase in enrolment in post-basic education, and the rise in the percentage of basic secondary graduates who go on to upper-secondary.

In 1990-91, only 75 percent of those who finished basic education continued on to upper-secondary; in 1998-99, the proportion rose to 95 percent (SEP 1999a). Table 1 shows that of all the students who attended upper-secondary in 1999, 7.96 percent went to CONALEP, 0.76 percent attended schools offering the *bachillerato general*, and 21.19 percent attended schools offering the *bachillerato técnico*. Tables A1.2 and A1.3 show the main differences between these educational systems.

Table 1. Enrollment in Upper-secondary by Type of School

	1997	%	*1998*	%	*1999*	%
Federal (SEIT, SESIC)	1,015,636	38.97	1,032,059	38.03	1,035,960	36.93
General Upper-secondary (Bachillerato General)	*20,781*	*0.80*	*20,373*	*0.75*	*21,375*	*0.76*
Upper-secondary by cooperation	*68,441*	*2.63*	*67,262*	*2.48*	*66,788*	*2.38*
Upper-secondary (COBACH)	*83,946*	*3.22*	*89,369*	*3.29*	*88,016*	*3.14*
Technical Upper-secondary	*597,416*	*22.92*	*594,762*	*21.92*	*594,581*	*21.19*
Technician (CETIS and CBTIS)	*45,073*	*1.73*	*38,947*	*1.44*	*40,154*	*1.43*
Technician CONALEP	*197,906*	*7.59*	*218,884*	*8.07*	*223,273*	*7.96*
Technician (Others)	*2,073*	*0.08*	*2,462*	*0.09*	*1,773*	*0.06*
State	703,515	26.99	773,195	28.49	815,421	29.06
Autonomous (University)	374,201	14.36	369,992	13.63	367,960	13.12
Private	512,743	19.67	538,651	19.85	586,193	20.89
Total	2,606,095	100.00	2,713,897	100.00	2,805,534	100.00

Source: SEP, "Compendio Estadístico por Entidad Federativa 1999," DGPPP.

IV. CONALEP

In December of 1978, the Mexican Government created CONALEP as a public decentralized body of the Ministry of Public Education (SEP). CONALEP was intended to provide a national network of upper-secondary schools that would prepare young people to become technicians at the upper-middle educational level. At this skill level 4 in the ISCED international classification (upper-secondary), there was a gap that was growing with the increasing demands for skilled labor. With the establishment of CONALEP, the Government also wanted to strengthen and rationalize the complex provision for technical secondary education in Mexico.

In 1979, the first ten CONALEP schools were opened, offering training in seven careers to 4,100 students. Not surprisingly, five of these careers focused on manufacturing, while the other two careers dealt with medical assistant and nursing professions. By 1982 the number of students enrolled in courses in CONALEP leading to technical qualifications increased to 72,000 and by 1989-1990 the total was 155,300. Since 1983, in addition to its career programs for technicians, CONALEP has also offered short courses for industry. This program was expanded

in 1986 through the introduction of mobile training facilities. By 1990, the number of students enrolled in these courses had increased to 61,300.

The major growth in student numbers during this period was facilitated by a rapid growth in the number of CONALEP schools, from 10 in 1979 to 239 in 1986, by which date all 31 states in Mexico had CONALEP schools. However, the distribution of students by state was uneven, with about one-third of all students attending schools within the metropolitan zone of Mexico City. The size of the individual CONALEP schools was also uneven. The number of careers expanded substantially from the original seven to 146 by the beginning of the 1990s, although these careers were reduced to 29 between 1993 and the beginning of 1997. The rapid growth during the 1980s and the beginning of the 1990s coincided with a shift toward white-collar occupations in commerce, administration, computing, and accounting, which now comprise more than half of the students in CONALEP. The educational services at CONALEP schools were expanded in 1991-1992 by the introduction of the modular program, which was the forerunner of the competency-based education and training (CBET).

In 1994, as part of the Education Modernization Project (PMETyC) financed by the World Bank, CONALEP introduced a competency-based model (CBET) for nine careers, to bring the CONALEP education program closer to the needs of industry. The initial pilot project to introduce competency-based education and training effectively in CONALEP demonstrated the challenges of this new way of teaching. This project helped the institution to understand the complexities of its significant role as a player in the forthcoming standards-based approach to education and training, and the need for major reforms to its administration and educational practices.

The CONALEP decision to move to CBET was a direct consequence of Mexico's decision to develop national competency standards as part of PMETyC, coordinated by the SEP and the Ministry of Labor (STPS). This new approach is run by the Council for Standardization and Certification of Labor Competencies (CONOCER), which is organized as a trust (fidecomiso) governed by a tripartite board of directors consisting of labor representatives, entrepreneurs, and government. The SEP budget finances the trust. Established in 1995, PMETyC is intended to strengthen the links between formal education, training, and the needs of the labor market.

Different countries are coming to terms with the requirements of work-based training in different ways (Ahier, 1999). Learning can take place in a range of settings, including on the job, off the job, in a technological institution, and at home. The skills required for employment involve lifelong learning to upgrade skills, preparing people for higher levels of employment, or providing opportunities to develop life skills that make people more valuable as citizens. This last aim sparks much debate, and different countries weigh programs differently depending on local perspective. European countries have always placed considerable emphasis on the general education component of formal vocational courses; Mexico has done the same (Boud and Garrick 1999).

Countries such as the United Kingdom, Australia, and New Zealand have put much less emphasis on these broader considerations, concentrating more in their vocational courses on developing the technical skills needed in the workplace. There is now a move away from such an instrumental approach toward a more balanced curriculum. This new direction emphasizes more

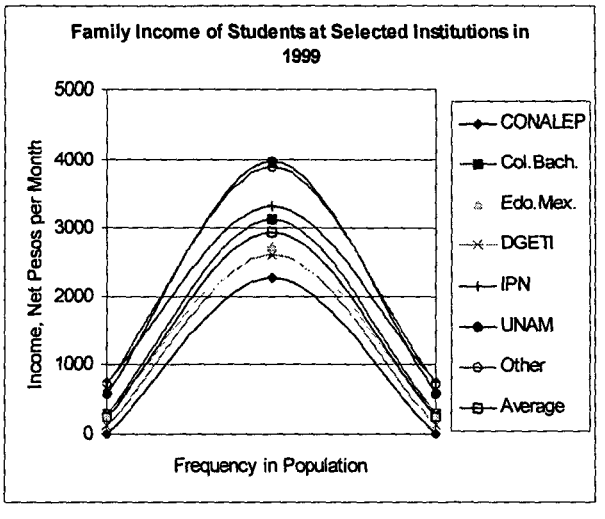
generic skills and seeks not to cut off the range of students' options too early, allowing them to move more easily to higher levels of learning in the same field or a new one (Hobart 1999).

The importance of career programs that allow students to develop general skills alongside technical ones has been acknowledged in many countries (Frantz 1998). These skills have different names in different countries—they are called key competencies in Australia, strategy for prosperity in Canada, process independent qualifications in Denmark, crossing or transferable skills in France, key qualifications in Germany, essential skills in New Zealand, core or common skills in the United Kingdom, and workplace know-how in the United States (Hobart 1999). In light of the increased need for more generic skills, Mexico has started to re-examine its own strategy, as specific technical skills can quickly become outdated.

V. The Evaluation of the CONALEP System: Students and Graduates

The socioeconomic and academic level of CONALEP students varies according to location. Data from the National Evaluation Center (*Centro Nacional de Evaluación*, CENEVAL) suggests that CONALEP most frequently serves students from a lower socioeconomic status at the upper-secondary school level in Mexico City. The results of a random sample of those who took the entrance examination to upper-secondary school in the metropolitan area of Mexico City in 1999

Figure 1



Note: This graph assumes normal population distribution.

suggest that CONALEP students come from families with the lowest average income and the lowest parental education (Figure 1). The parents of an average CONALEP student have about two years less formal education than the parents of a student attending a *Colegio de Bachilleres*, and three years less formal education than the parents of a student attending the high schools of the *Instituto Politécnico Nacional.*

Students attending CONALEP do not necessarily do poorly on the entrance test, nor do they all come from low educated or low-income parents. About 20 percent of CONALEP students in this sample scored higher than the average student attending the *Colegio de Bachilleres.*

Approximately 35 to 40 percent of the parents of CONALEP students have higher levels of education than the parents of an average student at the *Colegio de Bachilleres*. Nonetheless, on average, CONALEP students come from the lower socioeconomic categories and generally have lower scores in the CENEVAL examination than students in the other streams of upper-secondary education. Only students attending other technical-professional schools (DGETI) are comparably low on these indicators.

Table 2. CONALEP Students Compared to Students from Selected Institutions
Centro Nacional de Evaluacion

All[1] Institutions	Option[2] Number	Global[3] Test Score	Family[4] Income	GPA in[5] Lower-secondary	Mother's Schooling[6] (years)	Father's Schooling[6] (years)	Private Lower Sec = 1
CONALEP							
Mean	2.27	54.2	2271.2	7.627	7.1	8.2	8.70E-03
N	460	460	460	460	460	460	460
SD	2.13	15.3	2269	.6992	4.8	5.2	9.29E-02
Col.Bach.							
Mean	3.05	66.4	3132	7.658	9.0	10.0	3.33E-02
N	421	421	421	421	421	421	421
SD	2.28	13.2	2845	.75722	5.2	5.1	.18
Edo.Mex.							
Mean	2.41	64.6	2721	7.931	8.452	9.9	1.76E-02
N	1192	1192	1192	1192	1192	1192	1192
SD	2.09	16.56	2436	.7600	4.9	5.2	.13
DGETI							
Mean	2.71	59.6	2610	7.7205	7.700	9.2	2.20E-02
N	682	682	682	682	682	682	682
SD	2.32	15.6	2488	.7271	5.0	5.4	.15
IPN							
Mean	1.97	80.7	3315	8.1865	9.8	11.3	5.81E-02
N	430	430	430	430	430	430	430
SD	1.61	13.9	2652	.7871	4.7	5.0	.23
UNAM							
Mean	1.46	88.1	3967	8.3935	9.8	11.4	9.41E-02
N	510	510	510	510	510	510	510
SD	.83	11.6	3385	.7864	5.212	5.0	.29
Other							
Mean	1.38	82.9	3896	8.5417	11.969	12.9	8.33E-02
N	48	48	48	48	48	48	48
SD	.96	15.8	3164	.8124	3.676	4.2	.28
TOTAL							
Mean	2.33	67.9	2945	7.9248	8.6	10.0	3.50E-02
N	3743	3743	3743	3743	3743	3743	3743
SD	2.03	18.5	2693	.7982	5.1	5.2	.18

1. Col.Bach. refers to *Colegio de Bachilleres*, the local answer to over-demand; Edo.Mex. to the Estado de Mexico, state-centralized high school system; DGETI is the Dirección General de Educación Técnica Profesional, a centralized institution; IPN is the Instituto Politécnico Nacional –centralized-; and UNAM is the Universidad Nacional Autónoma de Mexico –autonomous-.
2. This is the average preference number toward each institution from students who applied and got in.
3. Out of 128 questions.
4. In net pesos per month.
5. Grades go from 5 (fail) to 10.
6. Years of schooling.

CONALEP's Past Evaluations

The CONALEP system has been evaluated several times in the past. The first evaluation was done by CONALEP (1994) and CONALEP (1999) using graduate tracer surveys. These data sets are described in the next section. The other evaluations were done by Lane and Tan (1996) and by Lee (1998). CONALEP also hired international consultants (Carnoy and others 2000) to assess the evolution of the CONALEP system. For this purpose the consultants used a different data set as is explained below.

The CONALEP (1994) and (1999) tracer studies had several problems, one of the most important being the lack of a well defined control group. A control group was expected to be added later, using data from the National Urban Employment Survey (ENEU). However, the studies neither include in-depth information on how the analysis was performed nor do they provide useful information on how CONALEP graduates perform relative to a control group.

Lane and Tan (1996) also encountered several problems in their evaluation. The first was the construction of a non-arbitrary control group. The ENEU sample is representative of metropolitan areas while the CONALEP graduate tracer survey is representative nationally. The difference in geographical coverage of the two groups makes comparison difficult. Second, the control groups were constructed ad hoc. The control groups included individuals between the ages of 17 and 30: (a) those who have completed lower-secondary education; (b) those who have completed non-professional, elementary vocational training (CECATI), and (c) those who have completed one to three years of general academic (non-vocational) high school. Some doubts remain with respect to the second group, since the ENEU survey does not distinguish between formal and informal training/technical courses.

Lee (1998) compares the individuals from the *Encuesta de Egresados* 1994 (the treatment group) with two other groups. One group comprises all 1991 graduates from upper-secondary diversified technical education programs; this group's labor force participation and employment performance in January 1994 was compared with that of CONALEP graduates of 1991, and of 1991-93 combined. The first comparison group was created from a mail survey of all graduates, with a 45 percent response rate, and therefore is likely to be biased toward those who were either employed, studying, or had a higher level of earnings. The second comparison group was made

up of employed workers aged 20 to 24, as reported in the aggregates of the ENEU of January 1994.

The results of these evaluations concluded that CONALEP graduates actively participated in the labor market at a much higher rate than the similar age cohort of the general population, and at a much higher rate than graduates from traditional technical high schools. On average, CONALEP graduates found jobs faster than control individuals, and about two-thirds of CONALEP graduates worked in jobs related to the specialization they had studied. Using cross-cohort comparison, these evaluations also suggested that CONALEP graduates' earnings increased rapidly within the first two to three years of employment.

These conclusions are as expected, although the magnitudes of the participation rate and the increase in earnings in comparison to the magnitudes in traditional technical high schools and the general population are surprising—thirty percent in Lane and Tan, and forty percent in Lee. The results should be considered with caution, since these studies failed to control for possible self-selection bias that could account for different labor market outcomes between the CONALEP group and the comparison groups. In addition, some of these evaluations do not fully explain how the control groups were constructed.

A fourth evaluation, aimed at understanding the background experience and goals of CONALEP students, conducted a survey with five percent of the senior students (ready to graduate) and freshmen students, the control group. The sample was 4,930 third year students and 725 first year students who, on the basis of their responses, were then divided into three groups using a socioeconomic status indicator. The results confirm the assumption that close to one-third of the students from CONALEP come from a low socioeconomic background. Another

40 percent come from a middle socioeconomic range. About 18 percent have parents with basic secondary school or more, own their own home with four or more rooms and have either a car, a phone, or both. The average entry test scores for the sample show several important trends in social class, gender, and cohort, as described below.

Girls in both cohorts enter CONALEP with slightly lower scores than boys. The first year (1999) cohort entered with higher scores than the third year (1997) cohort. We would assume that a higher fraction of those in the 1997 cohort who had lower entry scores would have dropped out by the third year. Thus, we could conclude that CONALEP student entry scores have actually risen more than suggested by the data. In the third-year cohort, entry scores positively correlated with rising socioeconomic indicators for both boys and girls. However, there seems to be little relationship between socioeconomic status and entry score in the 1999 cohort, except for higher-class girls.

In sum, CONALEP students come from relatively low socioeconomic backgrounds and tend to score at the lower passing end of the higher secondary school entry test. About half have general basic secondary education, with another third coming from basic technical secondary schools. Somewhat less than half of the third year students indicate that the CONALEP option was their first choice of higher secondary school, and somewhat more than half of the first year cohort say it was their first choice.

A second questionnaire was given to firms that hired CONALEP graduates from regular courses or training courses. In general, the interviewed firms who hire students from CONALEP and use its training services think highly of the organization. Approximately 72 percent of firms (public lower, private higher) think that the academic level attained by CONALEP students is

high or very high. About 55 to 60 percent of companies said that the technological level of a CONALEP education is high or very high, with large public companies giving the lowest ranking (46 percent).

VI. Data

The CONALEP Graduate Tracer Surveys

This paper re-evaluates CONALEP's effectiveness using the CONALEP graduate tracer surveys conducted in 1994 and 1998.[5] The first CONALEP graduate tracer survey was conducted in February 1994 (CONALEP, 1994) on the basis of a random sample of 1500 former CONALEP students who graduated between June 1991 and June 1993. The surveyed graduates were selected to represent the profile of the graduates in each of the three years in terms of all 13 major occupational groups of careers and the six geographical regions of the country. However, the sample is dominated by 1992 graduates who comprise 50 percent of the sample; 1991 and 1993 graduates each represent 25 percent. The sample selection is probabilistic and statistically representative of the universe of graduates in each cohort. For each graduate (M), two substitutes were chosen from the same career and school (S and T).

Table 3. Distribution of the 1994 Sample by Cohort

Graduation Year Cohort	Planned Selection	%	Actual Selection	%
1991	375	25	346	24.7
1992	750	50	704	50.3
1993	375	25	349	24.9
Total	1500	100	1399	100

Source: CONALEP (1994).

[5] A third CONALEP graduate tracer survey was conducted in January of 2001. The data are expected by mid-2001.

Table 4. Actual Sample Selection (original and substitutes by cohort)

	Selected	Substitutes			Total	% vs 1,500
Graduation Year Cohort	M	S	T	Z	346	23.1
1991	268	53	20	5	704	49.9
1992	560	96	42	6	349	23.3
1993	286	46	15	2	1,399	93.3
Total	1,114	195	77	13		
Cumulative percentage	74.3%	87.3%	92.4%	93.3%	93.3%	

Source: CONALEP (1999).

The second CONALEP Graduate Tracer Study (CONALEP 1999) was conducted between May and June of 1998 on the basis of a random sample of individuals who graduated between June 1993 and June 1997. The sample is representative of geographical regions, all 29 careers and all cohorts. The difference between the actual sample of 5,574 individuals and the planned sample of 10,000 was due to exogenous factors such as changes in address (3,590 cases); addresses that belonged to different states (651 cases); differences between the number of graduates officially registered and those found in the administrative records (229 cases), and technical careers that had never been offered (7 cases). CONALEP (1998) extensively reviews the sample frame of the second CONALEP Graduate Survey as described by LEVANTA, the consultant firm which designed the sample process. The distribution of the 1998 CONALEP survey was as follows. The table shows that the response rate is high.

Table 5. Distribution of the 1998 Sample by Cohort

Cohort	Interviewed Graduates		% Completed Interviews
	Number	%	
90-93	779	14.0	59.0
91-94	951	17.1	72.0
92-95	1,127	20.2	85.4
93-96	1,268	22.7	96.1
94-97	1,449	26.0	109.8[6]
Total	5,574	100.0	84.5

Source: LEVANTA C.

[6] This value, as listed in CONALEP data sets, appears to exceed 100 percent because the number of responding graduates exceeded the goal number.

The ENE98 and ENECE99 Surveys

Two other surveys are used in this paper, The National Employment Survey (ENE) and the National Employment, Schooling, and Training Survey (ENECE). The first is representative at a national level and by urban and rural areas. It has rich information on individual labor market characteristics. The ENE98 has a sample size of nearly 200,000 individuals. The second survey is a module of the National Employment Survey. The 1999 sample size was 164,550 individuals. The ENECE is also representative at the national level and has useful additional information on the professional profile of the individuals and the training status, such as type of training received, training time, date of training, place of training, etc.

VI.1 Methodology

In order to compare CONALEP graduates to a control group, this paper examines labor force participation, employment status, earnings, training and hours worked for both the CONALEP group and the control group. To construct the control group, this paper uses the statistical approach of propensity score matching. As discussed by Ravallion (1999) and Todd (1999), the idea behind matching is to find a comparison group that is as similar as possible to the treatment group in terms of the relevant observable characteristics such as age, sex, education, region of residence, as summarized by the propensity score. In calculating the propensity scores, we followed Ravallion's methodology (1999) and Gill and Dar (1995).

First, we chose two representative sample surveys of eligible non-participants as well as one of the participants. The two surveys of eligible non-participants are The National Employment Survey of 1998 (ENE98) and the National Education, Training, and Employment

Survey of 1999 (ENECE99). Both surveys have the advantage of a large number of eligible non-participant respondents, which ensures good matching. The participant survey used is the 1998 CONALEP graduate tracer study. Although the participant and non-participant data come from different surveys, the surveys are comparable since some of the questions are identical, all are from similar survey periods, and all are nationally representative.

Next, the two samples were pooled and a logit model of CONALEP participation as a function of the variables that are likely to determine participation was estimated. The variables included were age, sex, education, region of residence, and the location where training was under taken. The predicted values of the probability of participation were created from the logit regression —the propensity scores. There was a propensity score for every sampled participant and non-participant.[7] The goodness of fit and the models estimations are shown in Tables A1.4, A1.5 and A1.6. These models consistently classified correctly 99 percent of the non participant group cases and 72 percent of the participant group cases. The overall percentage of correctly predicted cases is 98 percent. Then we calculated propensity scores of the three and five nearest neighbors. This means that for each individual in the CONALEP group, the three and five observations in the non participant sample that have the closest propensity score were found, as measured by the absolute differences in scores. Alternatively, another transformation was used, the lag-odds ratio log (p/(1-p)), where p is the propensity score for matching. Heckman and others (1998) have proposed an alternative method for the nearest neighbor. Instead of relying on the nearest neighbor, they use all the non-participants as potential matches but weigh each according to its proximity.

[7] Those individuals staying at home, in an education program, or with zero hours of work were excluded from the sample.

The mean values of the outcome indicators for the three and five nearest neighbors were computed using labor market status, hourly earnings, earnings, economic sector, and training. The difference between the mean and the actual value for the treated observation is the estimate of the gain due to the program for that observation. The mean of these individual gains was computed to obtain the average overall gain.

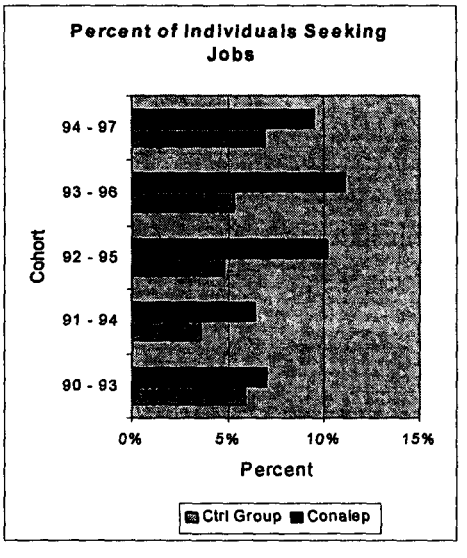
VI.2 Results

In order to assess CONALEP's effectiveness, we examine CONALEP graduates versus the control group in terms of labor force participation, status in the labor market, sector, further training at work, wages, and hours worked. Interpretation and tabular data of each area are presented in the following subsections.

Labor Force Participation[8]

Irrespective of distance criteria or nearest neighbors, the proportion of individuals seeking employment in the CONALEP group is higher than in the control group. It is unclear whether labor force participation of the CONALEP group has declined with respect to the control group over time. Additionally, the percent of individuals who are searching for a job is higher in the CONALEP group than in the control group.

Figure 2.



[8] Data for this section are presented as follows. Table 6 shows the labor force participation of the CONALEP graduates compared to the ENE98 control group. Table 7 shows the labor force participation of the CONALEP graduates compared to the ENECE99 control group. Both tables were calculated using the three nearest neighbors' distance. Tables A2.1 and A2.2 show the results using the five nearest neighbors criteria.

It is difficult to interpret why this proportion increased substantially for the cohort graduating in 1996, a crisis recovery year. It appears that the peso crisis, from which Mexico recovered in 1995-6, had a much larger effect on CONALEP graduates than it did on control group individuals (Tables 6-7).

The labor force participation rate of CONALEP graduates is shown in Table 6.[9] Contrary to previous studies, the results indicate that the share of CONALEP graduates in the working population is lower than the control group. Moreover, the CONALEP job search share is higher compared to the control group. Further analysis might be needed to explain the greater percent of CONALEP graduates who are searching for a job. Results also suggest that between 2 and 3.5 percent more control individuals worked without pay than CONALEP graduates did (Tables 8-9). Although between 3.9 and 5.6 percent more control individuals are employed than CONALEP individuals are, CONALEP individuals earn between 20 and 27.5 percent more per hour than control individuals do (Tables 6-7, 15-16). It appears, then, that the lack of employment of CONALEP graduates relative to the control group does not translate into a lack of income.

[9] Only those working or searching for a job were considered in the matching exercise.

Table 6. Labor Force Participation by Cohort
Matching group: Age 17-65. Three nearest neighbors based on propensity scores

	Working people			*Searching for a job*		
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 – 93	94.1	93.0	-1.0	5.9	7.0	1.0
91 – 94	96.4	93.6	-2.8	3.6	6.4	2.8
92 – 95	95.2	89.9	-5.3	4.8	10.1	5.3
93 – 96	94.7	88.9	-5.8	5.3	11.1	5.8
94 – 97	93.1	90.5	-2.6	6.9	9.5	2.6
Total[1]	94.8	91.2	-3.6	5.2	8.8	3.6
ENE 98[2]	97.5			2.5		
ENE 98, LS[3]	94.5			5.5		
ENE 98, US[4]	95.7			4.3		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 7. Labor Force by Cohort
Matching group: Age 17-65. Three nearest neighbors based on propensity scores

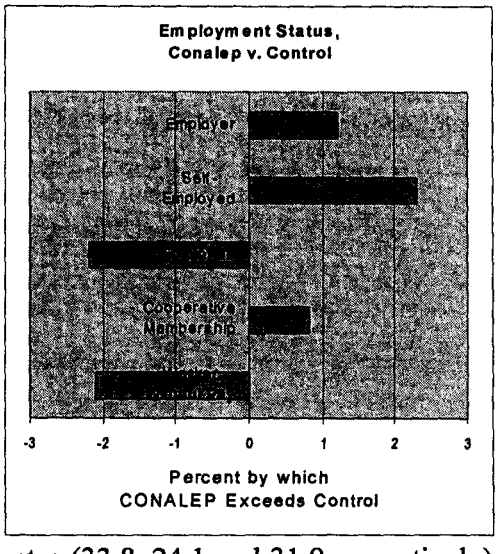
	Working people			*Searching for a job*		
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 – 93	97.0	94.5	-2.5	3.0	5.5	2.5
91 – 94	95.7	93.1	-2.7	4.3	6.9	2.7
92 – 95	96.3	88.3	-8.0	3.7	11.7	8.0
93 – 96	94.7	88.8	-5.9	5.3	11.2	5.9
94 – 97	95.7	87.9	-7.8	4.3	12.1	7.8
Total[1]	95.9	90.8	-5.1	4.1	9.2	5.1
ENECE 99[2]	98.1			1.9		
ENECE 99, LS[3]	95.7			4.3		
ENECE 99, US[4]	98.4			1.6		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Employment Status[10]

In general, there are not substantial differences between the employment status of CONALEP graduates compared to the control groups using either ENE98 or ENECE99. A large proportion of both CONALEP graduates and the control group individuals are employees. Albeit, the proportion of CONALEP graduates that are employees or wage earners (84.3 and 83.8) is less than in the control groups (86.5 and 84.6). The proportion of self-employed is higher among CONALEP graduates (9.8) than it is in the ENE98 control group (7.5). There is also no clear pattern of this proportion through time. Interestingly, the proportion of self-employed in the 1991-1994 cohort (5.3) is higher compared to the self-employed in the 1993-1996 cohort (2.6). This might indicate that self-employment increases as graduates gain more work experience.[11]

Figure 3.



In relation to employment sectors, commerce, restaurants, hotels, personnel, communications, and government have the highest percent of CONALEP graduates (33.8, 24.1 and 31.9 respectively). Unsurprisingly, these sectors also employ the largest share of individuals in the control groups. In Mexico, both manufacturing and services employ close to 80 percent of the labor force. Few

[10] Data for this section are presented as follows. Table 8 shows the employment status of the CONALEP graduates compared to the ENE98 control group. Table 9 shows the employment status of the CONALEP graduates compared to the ENECE99 control group. Tables A2.3 and A2.4 show the employment status using the five nearest neighbors criteria. Table 10 shows the proportion of CONALEP graduates and the proportion of ENE98 individuals in the control group by economic sector. Table 11 shows the proportion of CONALEP graduates and the proportion of ENECE99 individuals in the control group by economic sector. Tables A2.5 and A2.6 show the results using the five nearest neighbors criteria.

[11] Maloney (2000) asserts that some Mexican workers are joining the informal sector voluntarily at the prospect of higher incomes. Furthermore, at least for some workers, especially those with limited educational achievements, leaving formal sector employment represents a desirable professional move which entails more responsibilities and higher pay.

CONALEP graduates work in the primary sector, the extraction (mining) sector or the electricity and gas sectors. With respect to overall patterns of employment, considering both sector and labor market status, the results for the CONALEP group are very similar to those obtained for the control groups. An important feature, however, is that CONALEP offers careers that are demanded in the manufacturing and service sectors. Due to the ENE98 limitations, it is not possible to assess in detail the type of job obtained by the individual. However, the CONALEP graduate tracer survey allows us to infer whether there is congruency in the CONALEP graduate professional profile. Among the employed CONALEP graduates, more than half reported that they were working in the occupational category congruent with their field of specialization. Close to 70 percent of employed graduates consistently reported that CONALEP training or specialization was "very useful" or "useful" in their current occupation. This high rate of congruency might be comparable to the high rate among apprentices in Germany, but it is significantly higher than in other developed countries (OECD 1997).

Table 8. Employment Status. Matching group: Age 17-65. Three nearest neighbors based on propensity scores

Cohort	*Employer*			*Self-employed*			*Employee*			*Cooperative membership*			*Worker without pay*		
	Control Group	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*
90 - 93	1.0	2.8	1.9	8.0	9.3	1.4	85.6	85.8	0.2	0.0	0.0	0.0	5.4	2.0	-3.4
91 - 94	1.2	2.9	1.7	7.3	12.5	5.3	88.2	81.4	-6.8	0.0	0.7	0.7	3.4	2.5	-0.9
92 - 95	1.6	2.3	0.7	7.4	9.4	2.0	85.5	84.8	-0.8	0.0	1.2	1.2	5.4	2.3	-3.1
93 - 96	2.4	3.6	1.1	8.1	10.7	2.6	85.1	83.0	-2.1	0.0	0.8	0.8	4.4	2.0	-2.5
94 - 97	0.9	1.3	0.4	6.7	6.4	-0.3	88.1	87.2	-1.0	0.0	1.3	1.3	4.2	3.8	-0.4
Total[1]	1.4	2.6	1.2	7.5	9.8	2.3	86.5	84.3	-2.2	0.0	0.8	0.8	4.6	2.5	-2.0
ENE 98[2]	4.3			24.1			60.2			0.04			11.4		
ENE 98, LS[3]	0.2			4.8			77.9			0.02			17.1		
ENE 98, US[4]	2.5			11.0			77.8			0.00			8.7		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 9. Employment Status. Matching group: Age 17-65. Three nearest neighbors based on propensity scores

Cohort	*Employer*			*Self-employed*			*Employee*			*Cooperative membership*			*Worker without pay*		
	Control Group	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*
90 - 93	1.2	4.0	2.8	11.0	13.3	2.3	84.0	82.0	-2.0	0.0	0.0	0.0	3.7	0.7	-3.0
91 - 94	2.1	1.8	-0.4	7.0	13.6	6.7	86.1	81.7	-4.4	0.0	1.2	1.2	4.8	1.8	-3.0
92 - 95	1.2	2.9	1.6	8.6	10.0	1.4	85.2	85.7	0.5	0.0	0.7	0.7	4.9	0.7	-4.2
93 - 96	2.7	6.9	4.2	8.1	6.2	-1.9	81.2	84.6	3.4	0.0	0.0	0.0	8.1	2.3	-5.7
94 - 97	0.9	1.0	0.2	6.9	7.1	0.2	86.2	86.7	0.5	0.9	1.0	0.2	5.2	4.1	-1.1
Total[1]	1.7	3.3	1.7	8.4	10.5	2.1	84.6	83.8	-0.7	0.1	0.6	0.5	5.3	1.7	-3.5
ENECE 99[2]	4.0			24.4			60.8			0.03			10.7		
ENECE 99, LS[3]	0.2			4.4			79.6			0.00			15.9		
ENECE 99, US[4]	2.9			9.2			81.4			0.02			6.5		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 10. Economic Sector. Matching group: Age 17-65. Three nearest neighbors based on propensity

Cohort	*Agriculture, fishing, etc.*			*Extraction*			*Manufacturing*			*Construction*			*Electricity, gas, and water*		
	Control Group	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*
90 – 93	2.3	0.8	-1.4	0.1	0.0	-0.1	22.2	29.8	7.6	3.0	1.2	-1.8	0.8	0.8	0.0
91 – 94	1.3	2.8	1.5	0.1	0.4	0.2	20.4	33.3	12.9	2.5	2.1	-0.4	0.4	0.4	-0.1
92 – 95	2.1	0.4	-1.7	0.1	0.8	0.7	24.4	35.7	11.3	2.4	3.1	0.7	0.2	0.4	0.2
93 – 96	2.5	0.4	-2.1	0.1	0.4	0.3	25.7	32.1	6.4	2.6	4.0	1.3	0.7	0.4	-0.3
94 – 97	1.5	0.9	-0.6	0.1	0.0	-0.1	25.8	38.5	12.6	2.5	3.0	0.5	0.1	0.4	0.3
Total[1]	1.9	1.1	-0.8	0.1	0.3	0.2	23.6	33.8	10.2	2.6	2.7	0.1	0.5	0.5	0.0
ENE 98[2]	20.3			0.4			18.1			5.51			0.5		
ENE 98, LS[3]	17.0			0.1			31.8			4.57			0.2		
ENE 98, US[4]	6.3			0.5			19.7			2.22			1.3		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 10. (cont.)

Cohort	*Commerce, Restaurants, and Hotels*			*Transportation and Communications*			*Financial Services*			*Personnel, Common, and Social Services*		
	Control Group	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*
90 – 93	27.8	29.8	2.0	4.9	4.9	0.0	2.4	4.1	1.7	36.5	28.6	-7.9
91 – 94	29.2	23.9	-5.3	4.9	2.5	-2.4	2.7	2.5	-0.3	38.5	32.3	-6.2
92 – 95	29.0	22.5	-6.5	5.6	3.5	-2.1	3.1	3.1	0.0	33.2	30.6	-2.6
93 – 96	27.0	22.2	-4.8	4.5	1.6	-3.0	2.0	1.6	-0.4	34.8	37.3	2.5
94 – 97	27.1	22.2	-4.9	5.3	2.6	-2.7	1.0	2.1	1.1	36.6	30.3	-6.2
Total[1]	28.1	24.1	-4.0	5.0	3.0	-2.0	2.3	2.7	0.4	35.9	31.9	-4.0
ENE 98[2]	22.4			4.4			1.0			27.5		
ENE 98, LS[3]	26.0			3.6			0.2			16.5		
ENE 98, US[4]	31.6			8.1			2.9			27.6		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 11. Economic Sector. Matching group: Age 17-65. Three nearest neighbors based on propensity

Cohort	*Agriculture, fishing, etc.*			*Extraction*			*Manufacturing*			*Construction*			*Electricity, gas, and water*		
	Control Group	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*
90 – 93	1.2	0.0	-1.2	0.0	0.0	0.0	26.8	30.4	3.6	3.6	0.7	-2.9	0.0	2.0	2.0
91 – 94	1.5	1.2	-0.4	0.0	0.6	0.6	24.7	33.9	9.2	3.6	1.8	-1.8	1.0	0.6	-0.4
92 – 95	2.4	0.7	-1.6	0.0	1.5	1.5	18.9	27.7	8.8	3.0	1.5	-1.5	0.6	0.7	0.1
93 – 96	2.6	0.0	-2.6	0.6	0.0	-0.6	23.1	33.8	10.8	3.8	2.3	-1.5	0.0	0.8	0.8
94 – 97	3.3	1.0	-2.3	0.0	0.0	0.0	24.0	35.4	11.4	3.3	3.1	-0.2	1.7	0.0	-1.7
Total[1]	2.1	0.6	-1.5	0.1	0.4	0.3	23.5	32.1	8.6	3.5	1.8	-1.7	0.6	0.9	0.3
ENECE 99[2]	21.0			0.3			18.8			5.53			0.5		
ENECE 99, LS[3]	17.2			0.1			30.5			4.71			0.1		
ENECE 99, US[4]	4.1			0.2			18.2			2.29			0.3		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 11. (cont.)

Cohort	*Commerce, Restaurants, and Hotels*			*Transportation and Communications*			*Financial Services*			*Personnel, Common, and Social Services*		
	Control Group	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*
90 – 93	22.6	23.0	0.4	4.2	5.4	1.2	3.0	4.1	1.1	38.7	34.5	-4.2
91 – 94	28.4	25.6	-2.8	6.2	4.2	-2.0	2.1	2.4	0.3	32.5	29.8	-2.7
92 – 95	30.2	25.5	-4.6	7.1	2.2	-4.9	1.8	4.4	2.6	36.1	35.8	-0.3
93 – 96	28.8	20.8	-8.1	4.5	0.8	-3.7	0.0	3.1	3.1	36.5	38.5	1.9
94 – 97	27.3	21.9	-5.4	4.1	2.1	-2.0	1.7	0.0	-1.7	34.7	36.5	1.7
Total[1]	27.5	23.6	-3.9	5.3	3.1	-2.2	1.7	2.9	1.2	35.6	34.6	-1.0
ENECE 99[2]	21.5			4.5			0.9			27.0		
ENECE 99, LS[3]	22.1			2.1			0.2			22.9		
ENECE 99, US[4]	32.8			8.8			2.9			30.5		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Further Training[12]

About 39 percent of CONALEP workers receive further training at work, a significantly higher level than the 37.2 percent of control group individuals that do (Table 12). It appears that government investment in CONALEP training for an individual leads to additional investment by firms in training for the same individual. Moreover, a significant proportion of CONALEP graduates (89.7 percent) report that their training was related to their current employment or work activity. Although the 1994-1997 cohort shows a considerable increase in the proportion of CONALEP graduates receiving training related to work, a lower proportion of this cohort reported receiving further training than older cohorts did. In response to a question asking the purpose of further training, nearly 60 percent of CONALEP graduates said that they received training in order to update their technical knowledge (Table 14). Compared to the ENECE99 control group rate (near 32 percent), the CONALEP rate is quite high. This could indicate that employers invest more in training CONALEP graduates than they do in the control group because investment in the

Figure 4.

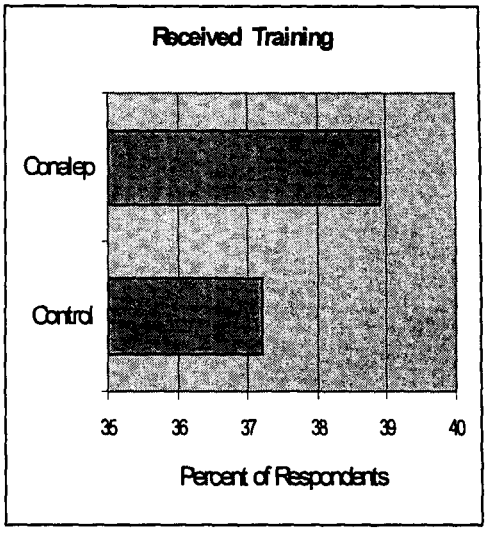
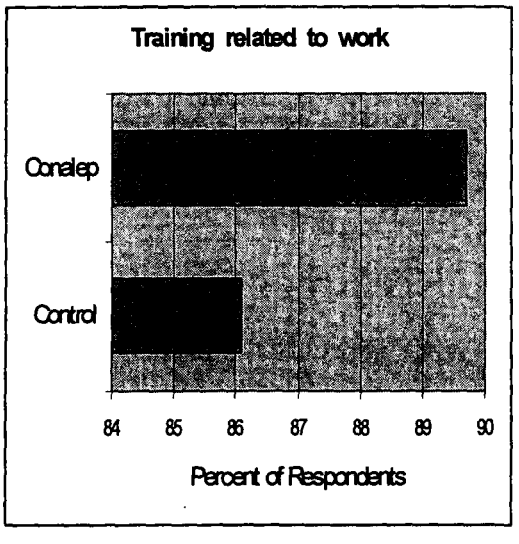


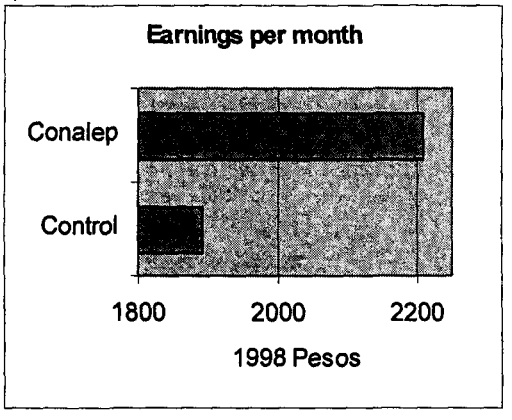
Figure 5.



[12] Data for this section are presented as follows. Table 12 shows the proportion of CONALEP graduates compared to the ENECE99 control group that receive further training at work. Table 14 indicates the reasons for further training among CONALEP graduates as well as individuals from the control groups.

CONALEP group is more profitable. Compared to the 1994-1997 cohort, the rate of further training is slightly higher for the 1991-1994 cohort and much higher for the 1990-1993 cohort, which could mean that individuals in older cohorts need to update their skills in order to work efficiently. The proportion of CONALEP graduates who undergo training because it is a job prerequisite increases over time. This suggests two possible explanations: (a) employers' expectations of CONALEP graduates rise as they become more familiar with them, and (b) the technical complexity of jobs held by CONALEP graduates increases over time.

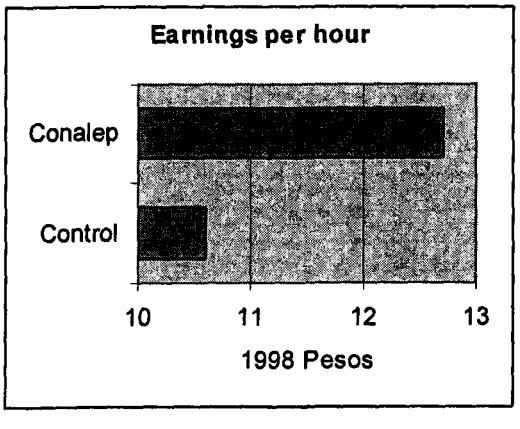
Figure 6.



Earnings and Hours Worked[13]

On average, CONALEP graduates earned 17 percent more than the ENE98 control group and 22 percent more than the ENECE99 control (Tables 15 and 16). Controlling for hours worked, CONALEP graduates earn close to 20 percent more than the ENE98 control group and 27.5 more than the ENECE99 control group. Even after the 1994 crisis, CONALEP graduates obtained higher earnings than individuals in the control group did. This might indicate that CONALEP has been a good alternative for low income individuals seeking a lasting job. Furthermore, it seems that in downturns such as in the 1994 crisis,

Figure 7.



[13] Tables 15 and 16 show average earnings, average earnings per hour, and average hours worked for CONALEP graduates and

CONALEP served as an alternative to other programs. The 1997 results are surprising, but as anomalous data this cohort may be treated as an outlier.

Table 12. Training Received at Work
Matching group: Age 17-65. Three nearest neighbors based on propensity

		Yes			*No*	
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 - 93	38.8	45.8	7.0	61.2	54.2	-7.0
91 - 94	38.2	34.3	-3.9	61.8	65.7	3.9
92 - 95	39.9	43.4	3.5	60.1	56.6	-3.5
93 - 96	34.4	38.5	4.1	65.6	61.5	-4.1
94 - 97	33.3	30.7	-2.6	66.7	69.3	2.6
Total[1]	37.2	38.9	1.7	62.8	61.1	-1.7
ENECE 99[2]	22.1			77.9		
ENECE 99, LS[3]	12.1			87.9		
ENECE 99, US[4]	39.1			60.9		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 13. Training Related to Work
Matching group: Age 17-65. Three nearest neighbors based on propensity

		YES			*NO*	
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 - 93	90.9	95.7	4.7	9.1	4.3	-4.7
91 - 94	84.2	88.3	4.1	15.8	11.7	-4.1
92 - 95	85.5	85.5	0.0	14.5	14.5	0.0
93 - 96	87.3	88.2	1.0	12.7	11.8	-1.0
94 - 97	81.4	90.0	8.6	18.6	10.0	-8.6
Total[1]	86.1	89.7	3.6	13.9	10.3	-3.6
ENECE 99[2]	86.1			13.9		
ENECE 99, LS[3]	74.2			25.8		
ENECE 99, US[4]	77.7			22.3		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

the ENE98 and ENECE99 control groups respectively.

Table 14. Reasons for Training. Matching group: Age 17-65. Three nearest neighbors based on propensity

	Prerequisite for entering a job			*Update*			*Self-interest*			*Was Requested*			*Other*		
Cohort	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*	*Control Group*	*CONAL EP*	*Difference*
90 – 93	9.1	7.1	-1.9	31.8	60.0	28.2	22.7	15.7	-7.0	27.3	10.0	-17.3	9.1	7.1	-1.9
91 – 94	9.1	8.3	-0.8	40.3	53.3	13.1	24.7	18.3	-6.3	20.8	11.7	-9.1	5.2	8.3	3.1
92 – 95	7.4	6.5	-0.9	39.7	53.2	13.5	22.1	24.2	2.1	26.5	8.1	-18.4	4.4	8.1	3.7
93 – 96	17.0	17.3	0.3	35.8	51.9	16.1	13.2	9.6	-3.6	30.2	7.7	-22.5	3.8	13.5	9.7
94 – 97	9.1	16.7	7.6	31.8	43.3	11.5	27.3	30.0	2.7	27.3	6.7	-20.6	4.5	3.3	-1.2
Total[1]	10.1	10.2	0.2	36.4	53.6	17.3	22.1	18.6	-3.5	26.0	9.1	-16.8	5.5	8.4	2.9
ENECE 99[2]	10.7			37.9			22.0			24.6			4.8		
ENECE 99, LS[3]	30.7			11.4			27.7			25.4			4.8		
ENECE 99, US[4]	13.9			27.2			27.5			26.9			4.5		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 15. Average Earnings, Earnings per Hour, and Hours Worked by Sample Group
Matching group: Age 17-65. Three nearest neighbors based on propensity (1998 pesos)

	Earnings			*Earnings per hour*			*Hours worked per week*		
Cohort	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*
90 - 93	1910.5	2660.0	749.5	10.6	14.3	3.7	44.5	46.4	1.9
91 - 94	1851.1	2170.4	319.4	11.0	12.4	1.3	43.8	45.6	1.8
92 - 95	1883.6	2262.3	378.7	10.7	14.9	4.2	43.5	46.0	2.4
93 - 96	1980.1	2288.8	308.8	10.7	12.3	1.6	45.3	46.9	1.6
94 - 97	1826.9	1655.1	-171.9	10.1	9.6	-0.5	44.3	45.0	0.7
Total[1]	1890.4	2208.7	318.3	10.6	12.7	2.1	44.3	46.0	1.7
ENE 98[2]	2046.0			11.6			43.5		
ENE 98, LS[3]	1266.3			6.6			44.8		
ENE 98, US[4]	2088.5			11.2			45.8		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table 16. Average Earnings, Earnings per Hour, and Hours Worked by Sample Group
Matching group: Age 17-65. Three nearest neighbors based on propensity (1998 Pesos)

	Earnings			*Earnings per hour*			*Hours worked per week*		
Cohort	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*	*Control Group*	*CONALE P*	*Difference*
90 - 93	2135.9	2878.9	743.0	11.5	15.3	3.8	44.2	45.3	1.1
91 - 94	1860.4	2177.5	317.1	10.4	12.5	2.1	44.4	46.0	1.6
92 - 95	2003.5	2757.3	753.8	11.1	16.5	5.4	43.9	44.7	0.8
93 - 96	2081.3	2561.7	480.4	11.5	13.6	2.1	43.7	46.8	3.0
94 - 97	1772.5	1733.5	-39.0	9.7	11.0	1.3	45.4	45.8	0.3
Total[1]	1977.1	2454.5	477.3	10.9	13.9	3.0	44.3	45.7	1.4
ENECE 99[2]	1984.4			11.2			43.8		
ENECE 99, LS[3]	1253.1			6.6			44.8		
ENECE 99, US[4]	2142.2			11.4			46.0		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1-5 years of experience (22-26 years old).

VII. Benefits from CONALEP Reformed Program

Given that the CONALEP graduate tracer surveys of 1994 and 1998 are comparable, this section analyzes the impact of modular courses and reform programs, innovations implemented by CONALEP after 1992. The cohorts from the survey of 1994 are considered to be graduates of the pre-reform program including cohorts who graduated in 1991, 1992, and 1993. Additionally, cohorts from the survey of 1998 are considered to be from the post-reform program including cohorts who graduated in 1994, 1995, 1996, and 1997. The first subsection describes the methodology used in the analysis, and the second discusses the results.

VII.1 Methodology

There are several methods for estimating duration models. The Kaplan Meier and the proportional hazard model were calculated to analyze whether graduates from the cohorts of the 1998 survey of the reformed program found a job faster than those from the cohorts of the 1994 survey of the pre-reformed program. In addition, multinomial models were estimated to assess if the reformed program increased individuals' probability of studying further after completing CONALEP. They also permitted estimation of the probability of having a certain status in the job market. Regression models were estimated to assess if the reformed CONALEP program increases CONALEP graduates' earnings. See Annex 3 for details of the methodology used.

VII.2 Results

Table 17 shows the Kaplan-Meier estimates of the mean and median time of job search after graduation. The median time for cohorts graduating before the reforms were introduced in CONALEP (Survey 94) is 4 months, while for those cohorts in the reformed program (Survey

98) the median time is 3 months. The preliminary finding based on the Kaplan Meier estimates is important because it shows that graduates from the 1998 Survey found jobs faster than those from the 1994 Survey. If only a simple average of values for surveyed individuals had been taken, the mistaken conclusion would be reached that graduates of the 1998 Survey search for a job longer than individuals of the 1994 survey do.

Table 17. Kaplan Meier Estimates
Job Search after graduation from CONALEP (Months)

	Time Estimated	
Probability {T>t}	*Survey 94*	*Survey 98*
0.25	12.0	7.0
0.5	4.0	3.0
0.75	1.6	1.0
Mean	9.2	6.8
Median	4.0	3.0
Cases censored	169 (20.4%)	124 (3.8%)
Total number of cases	827	3273

Table A4.1 shows the hazard ratio or risk of finding a job and a respondent's region.[14] Graduates from the 98 Survey have a 45 percent greater probability of finding a job than graduates from the 94 Survey do. Graduates from the North or Center of Mexico have a higher probability of finding a job (between 60 and 45 percent) than graduates from the South (22 percent) do. The 1993-1996 cohort had a 4 percent higher probability of finding a job than the other cohorts did. Also, the higher the level of schooling of the household head, the higher the chance of the CONALEP graduate of finding a job.

[14] Since employment is not conventionally a risk, we shall refer to the technical "risk" of finding employment as the "probability" or "chance."

In Table 18, some scenarios were calculated. Given a base category (male, living in the Center region, age, etc.), the median time for a male graduate to find a job in the 94 Survey is 4 months, and in the 98 Survey 2.8 months. The mean length of time that female graduates search for a job is longer than that for male graduates. Furthermore, female graduates in the 98 Survey found jobs faster than those from the 94 Survey did. Not surprisingly, the job search is longer for graduates without job experience while studying. However, the difference in job search time between individuals with work experience and those without is small.

Table 18. Cox Regression Model. Job Search (time) after finishing CONALEP

Covariate**	Survey 94	Survey 98		Difference
Male	**4.0**	**2.8**		1.2
Female	4.9	3.0		1.9
Age (mean=21.5 years)	**4.0**	**2.8**	*	1.2
Age (22.5 years)	4.0	2.8	*	1.2
Center Area	**4.0**	**2.8**		1.2
South-East Area	2.9	1.9		1.0
Center-South Area	2.9	1.9		1.0
North-East Area	2.0	1.9		0.1
North-West Area	2.8	1.9		0.9
Center-North Area	2.8	1.9		0.9
Pacific Area	2.8	1.9		0.9
91 Cohort	**4.0**			
92 Cohort	4.0			
93 Cohort	5.0			
94 Cohort		4.9		
96 Cohort		2.8		
97 Cohort		2.9		
None – Primary HH	**4.0**	**2.8**		1.2
Lower-Secondary HH	4.0	2.8	*	1.2
Upper-Secondary HH	4.0	2.8	*	1.2
University - + HH	4.0	2.0	*	2.0
Don't know HH	4.0	2.0	*	2.0
GDP per capita (mean=38.8)	**4.0**	**2.8**	*	1.2
GDP per capita	3.0	2.0		1.0
Worked when studying	**4.0**	**2.8**		1.2
Did not work when studying	5.0	3.0		2.0

** The other covariates are in the base category or at the mean.
Base categories: men, Center area (D.F. and Mexico), 91 cohort, none or primary school education of household head (HH), and had worked when he was studying at CONALEP.
Means: 21.5 years old, 38.8 thousands of 1998 pesos GDP per capita.
*Not significant at 5 percent.

Given the base category, 18 percent more of 98 Survey respondents were working than 94 Survey respondents were (Table 19). In the 94 Survey, the North, Center, and Pacific regions correlate with an increased probability of working. The probability of searching for a job is 17 percent more for the 1994 graduates than it is for the 1998 graduates. For 1994 female graduates, the probability of working is 16 percent higher than for 1998 female graduates. Also, the probability of searching for a job is slightly higher for the 1994 graduates than it is for 1998 graduates. The probability that a graduate continues to study is three percent higher in the 1994 than in 1998 Survey. For female graduates the probability of working at home as housewives is 16 percent higher in the 98 cohort (Table 19). The 94 Survey respondents earn higher hourly wages than the 1998 cohorts do (Tables A4.2, A4.3). A plausible explanation is that since 1994, real wages in Mexico have declined by almost 40 percent.

Table 19. Marginal Effects of Having a Certain Type of Activity after Completing CONALEP

Variable	Prob[*Activity=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect	Variable	Prob[*Activity=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect
j = Work				*j = Searching for job*			
98 Survey	0.77	0.59	0.183	98 Survey	0.08	0.26	-0.174
Women	0.64	0.80	-0.162	Women	0.10	0.11	-0.012
Age			0.004	Age			0.000
South-East Area	0.78	0.74	0.040	South-East Area	0.09	0.11	-0.027
Center-South Area	0.81	0.74	0.076	Center-South Area	0.08	0.11	-0.030
North-East Area	0.85	0.73	0.122	North-East Area	0.08	0.12	-0.039
North-West Area	0.82	0.73	0.085	North-West Area	0.06	0.12	-0.055
Center-North Area	0.84	0.73	0.111	Center-North Area	0.06	0.12	-0.055
Pacific Area	0.84	0.73	0.116	Pacific Area	0.04	0.12	-0.081
92 Cohort		0.75		92 Cohort		0.10	
93 Cohort		0.76		93 Cohort		0.09	
94 Cohort	0.46			94 Cohort	0.37		
96 Cohort	0.66			96 Cohort	0.20		
97 Cohort	0.43			97 Cohort	0.41		
Lower-secondary HH	0.73	0.75	-0.016	Lower-secondary HH	0.11	0.11	0.003
Upper-secondary HH	0.68	0.75	-0.069	Upper-secondary HH	0.11	0.11	0.001
University - + HH	0.73	0.75	-0.012	University - + HH	0.08	0.11	-0.035
Do not know HH	0.74	0.75	-0.003	Do not know HH	0.09	0.11	-0.021
GDP per capita			0.062	GDP per capita			-0.057

Base categories for independent variables: 94 Survey, men, Center area (D.F. and Mexico), 91 cohort, none or primary school education of household head (HH).
Units for GDP thousands of 1998 pesos.

Table 19. (cont.)

Variable	Prob[*Activity=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect	Variable	Prob[*Activity=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect
j = Student				*j = Housework*			
98 Survey	0.06	0.09	-0.031	98 Survey	0.08	0.04	0.034
Women	0.07	0.06	0.003	Women	0.17	0.01	0.160
Age			-0.005	Age			0.001
South-East Area	0.06	0.06	0.000	South-East Area	0.06	0.07	-0.009
Center-South Area	0.05	0.07	-0.014	Center-South Area	0.05	0.07	-0.021
North-East Area	0.03	0.07	-0.040	North-East Area	0.03	0.07	-0.040
North-West Area	0.04	0.07	-0.029	North-West Area	0.06	0.07	-0.005
Center-North Area	0.04	0.07	-0.033	Center-North Area	0.05	0.07	-0.025
Pacific Area	0.05	0.07	-0.014	Pacific Area	0.05	0.07	-0.023
92 Cohort		0.07		92 Cohort		0.07	
93 Cohort		0.06		93 Cohort		0.07	
94 Cohort	0.10			94 Cohort	0.04		
96 Cohort	0.07			96 Cohort	0.05		
97 Cohort	0.10			97 Cohort	0.03		
Lower-secondary HH	0.08	0.06	0.022	Lower-secondary HH	0.06	0.07	-0.011
Upper-secondary HH	0.12	0.06	0.063	Upper-secondary HH	0.07	0.07	0.003
University - + HH	0.13	0.06	0.063	University - + HH	0.05	0.07	-0.020
Do not know HH	0.04	0.06	-0.028	Do not know HH	0.11	0.07	0.041
GDP per capita			-0.016	GDP per capita			0.014

Base categories for independent variables: 94 Survey, men, Center area (D.F. and Mexico), 91 cohort, none or primary school education of household head (HH).
Units for GDP thousands of 1998 pesos.

VIII. Cost-Benefit Analysis

Campos (2001) and Carnoy and others (2000) provide a very detailed discussion on the unit costs of CONALEP, the *general bachillerato*, and the *media superior* schools. Unit cost data are provided for 1992, 1994, 1995, and 1998. Cost items are divided into two classes: investment in infrastructure and equipment, and operational expenses. Operational expenses include, among other things, salaries of teachers and administrators, security services, and utilities (electricity, telephone, water, etc.). The cost data refer to the three year program. The control group's unit cost per year is $11,512.90, or 7.4 percent higher than CONALEP's unit cost of $10,719.98 (in 1998 pesos). As shown in Section V, the control group's average earnings are lower than CONALEP's average earnings ($26,504.40 vs. $22,684.8, 1998 pesos). It follows that CONALEP's present value is always positive. An alternative scenario was estimated assuming that the control group's unit cost is unknown, that there is a discount rate of 5 percent, and that earnings differences remain constant over the next 30 years. The breakeven year, when the discounted present value of accumulated benefits equals costs, is 12 years in the alternative scenario. If opportunity costs are added, the breakeven year is 18 years.

IX. Conclusions

The Mexican government introduced CONALEP as an alternative technical education system to the traditional upper-secondary education. CONALEP has undergone significant structural changes in the past decade. A major transformation took place in 1991, when CONALEP reduced the number of careers offered from 146 to 29 careers and introduced modular courses, the forerunner of the competency based education and training model (CBET) now adopted in Mexico.

The first part of this paper re-examines CONALEP's performance compared to a well-designed control group. Contrary to previous evaluations, this paper shows that CONALEP graduates search longer for a job but that job congruency is higher compared to the control group. In agreement with previous evaluations, this paper shows that CONALEP increases graduates' earnings. However, the order of magnitude of earnings increase differs greatly from previous studies. This paper finds that on average, CONALEP increases graduates earnings by 22 percent —not the 30 or 40 percent found in other studies— compared to a control group.

The second part of this paper evaluates the benefits of the 1991-1992 CONALEP reforms. Results indicate that graduates from the pre-reformed program (94 Survey) search longer for a job compared to those of the post-reformed program (98 Survey). Moreover, graduates from the post-reformed program have 45 percent more probability of finding a job than those from the pre-reformed program. Furthermore, the 94 Survey cohorts earned higher hourly earnings than the 98 Survey cohorts. A plausible explanation is that since 1994, real wages have decreased in Mexico by almost 40 percent.

The third part of this paper examines CONALEP's cost-effectiveness. The results indicate that CONALEP is a highly cost-effective program. In addition, as mentioned by other authors, CONALEP has had spillover effects on the rest of the technical education system by stimulating other educational institutions to be more efficient and to adapt to a changing economic and social situation (Carnoy and others 2000).

It is difficult to discern the relative contribution of the different factors responsible for the good overall performance of CONALEP, but it is safe to conclude that the special features of CONALEP as a whole have made it possible. These are as follows: autonomous national

organizational structure, decentralized operation, strong link to industry, industry-experienced instructors, and modular courses. However, further challenges remain, notably curriculum adjustment to changing market circumstances and improvement of external and internal efficiency.

Selected References

Ahier, J. (ed.). 1999. *Education, Training and the Future of Work.* London: Routledge.

Carnoy, B., and others. 2000. *Aprendiendo a trabajar: Una revisión del Colegio Nacional de Educación Profesional Técnica y del Sistema de Universidades Tecnológicas de México.* Processed.

Campos, M. 2000. *Estudio de Costos del CONALEP.* Processed.

Boud, D., and J. Garrick. 1999. *Understanding Learning at Work.* London: Routledge.

CONALEP (Colegio Nacional de Educación Profesional Técnica). 1994. *Encuesta de Empleo a Egresados del CONALEP, Cohorts 1991, 1992 and 1993.* Final Report.

---------. 1999. *Encuesta de Empleo a Egresados del CONALEP, Cohorts 1991, 1992, 1993, 1994 and 1995.* Final Report.

Gill, I., and A. Dar. 1995. "Costs and Effectiveness of Retraining in Hungary." Internal Discussion Paper, Europe and Central Asia Region. The World Bank.

Frantz, N. 1998. "Identification of National Trends and Issues for Workplace Preparation and their Implications for Vocational Teacher Education." *Journal of Vocational and Technical Education* 14(1). Fall 1998. Blacksburg, Va.

Heckman, J., and others. 1998. "Matching as an Econometric Evaluation Estimator." *Review of Economic Studies* 65(2). April.

Hobart, B. 1999. "Globalization and its Impact on VET." *Review of Research.* Adelaide. NCVER.

Kye, L. 1998. "An Alternative Technical Education System: A Case Study of Mexico." Staff Working Paper No. 554. The World Bank.

Lane, J., and H. Tan. 1996. *Evaluación del Programa DGETI.* Processed.

Lee, K. W. 1998. "An Alternative Technical Education System: A Case of Study of Mexico." *International Journal of Educational Development.* Oxford.

López-Acevedo, G. 2000. "Teachers' Salaries and Professional Profile." HD Working Paper No.64. The World Bank.

Maloney, W., and G. López-Acevedo. 2000. *A Comprehensive Development Agenda for Mexico: Note on Labor Markets in Mexico.*

SEP (Secretaría de Educación Pública). 1997. *Informe de Labores.*

---------. 1998. *Informe de Labores.*

---------. 1999a. *Informe de Labores.*

---------. 1999b. *Compendio Estadístico por Entidad Federativa.*

OECD (Organisation for Economic Co-operation and Development). 1997. *Reviews of National Policies for Education: Mexico Higher Education.* Paris.

---------. 2000. *Education at a Glance.* Paris.

Todd, P. 1999. *A Practical Guide to Implementing Matching Estimators.* Processed.

Power, C. 1999. "Technical and Vocational Education for the Twenty-First Century." *Prospects: Quarterly Review of Comparative Education.* Vol. XXIX. No. 1. pp. 29-36. Paris. UNESCO.

Ravallion, M. 1999. "The Mystery of the Vanishing Benefits: Ms Speedy Analyst's Introduction to Evaluation." *Handbook on Evaluating the Poverty Impact of Projects*. The World Bank.

Sellin, B. 1999. *European Trends in the Development of Occupations and Qualifications*. Luxembourg. CDEFOP.

Smith, P. 1999. "The Internationalization of Vocational Education and Training." *Review of Research*. Adelaide. NCVER.

World Bank. 1997. "Mexico: Training Assessment Study." White Cover Draft.

---------. 1998. "Enhancing Total Factor Productivity Growth." Report No. 17392-ME (Gray Cover).

---------. 1999a. "Export Dynamics and Productivity: Analysis of Mexican Manufacturing in the 1990s." Report No. 19864-ME (Green Cover).

---------. 1999b. "Mexican Labor Markets; New Views on Integration and Flexibility." Volume Two: Technical papers. Poverty Reduction and Economic Management Unit. Mexico Department.

---------. 2000. "Earnings Inequality after Mexico's Economic and Educational Reforms." Report No. 19945-ME (Gray Cover). December. Mexico Department.

ANNEX 1

Table A1.1. Institutions that provide Upper-secondary Education in Mexico

General upper-secondary	Technical professional education	Technological upper-secondary
Bachilleres Colleges (CB)	College of Professional Technical Education (CONALEP)	Centers for Industrial and Services Technological Studies (CETIS)[2]
Preparatoria Schools	State Institutes for Work Training (ICATIS)[1]	Centers for Industrial and Services Technological *Bachillerato* (CBTIS)[2]
Science and Humanities Colleges (CCH)	State Colleges for Scientific and Technological Studies (CECyTE)[1]	Centers for Technical Industrial Studies (CETI)[4]
Incorporated *Bachillerato*	Centers for Industrial and Services Technological Studies (CETIS)[2]	Centers for Scientific and Technological Studies (CECyT)[5]
	Centers for Industrial and Services Technological Bachillerato (CBTIS)[2]	Centers for Technological Studies (CET)[5]
	Nursing and Obstetrics School (ESEO)[3]	State Colleges for Scientific and Technological Studies (CECyTE)[1]
		Centers for Ocean Technological Studies (CETMar)[6]
		Centers for Continental Water Studies (CETAC)[6]
		Centers for Farming and Agricultural Technological *Bachillerato* (CBTA)[7]
		Centers for Forestry Technological *Bachillerato* (CBTF)[7]

1. ICATIS and CECyTEs are operated by state Governments.
2. CETIS and CBTIS are coordinated by the General Directorate of Technological Industrial Education (DGETI).
3. ESEO is part of the National Polytechnic Institute (IPN). It is the only modality in which graduates are professional technicians.
4. CETI offers technical programs.
5. CECyT and CET are coordinated by IPN.
6. CETMar and CETAC are coordinated by Department of Scientific Education and Ocean Technology (UECyTM).
7. CBTA and CBTF are coordinated by the General Directorate of Farming and Agricultural Education (DGTA).

Source: Informe de Labores. Several years. SEP.

Table A1.2. Hours of Education for Work and Study

Institution	Hours of Theory and Practice in Workshops and/or Companies	Hours of Theoretical Study
Colegio de Bachilleres (Upper-secondary College)	6 in 3rd and 4th Semester 10 in 5th and 6th Semester	27 average
CONALEP	17 average in 1st Semester, up to 70% class hours weekly	33 average
Centros de Estudios de Bachillerato	14 in 5th and 6th Semester	26 to 29
CBTA	11 average	23 average
CBTIS Y CETIS (Upper-secondary)	11 average	23 average
CBTIS Y CETIS (Technical)	24 average	10 average
CECYT (IPN)	13	27
Colegio de Bachilleres (Upper-secondary College - State of Mexico)	14	17 to 20
CECYT (State of Mexico)	15 average	21 average
Centros de Bachillerato Tecnológico (Technological Upper-secondary Centers - State of Mexico)	13 to 14	26 to 27
Enfermería (Nurse Training School) (Technical UNAM)	32	12
Preparatory School (UNAM)		30
Colegio de Ciencias y Humanidades (College of Sciences and Humanities) (UNAM)		28
Preparatoria, Universidad Autónoma del Estado de Mexico (Preparatory from the Autonomous University of the State of Mexico) (UAEM)		37
Preparatorias Oficiales y Anexas a las Normales (Official Preparatories and Attached to the Teaching Schools) (State of Mexico)		36 to 38

Source: COMIPEMS 1998. CONALEP; CBTA; CBTIS; CETIS; CECYT.

Table A1.3. Number of Specialties by Institution

Institution	Number of Specialties	Type of Studies
CONALEP	29	Technical Professional
DGETI (CETIS, CBTIS)	42 12	Technical Professional Bivalent Upper-secondary
CETI. Techno-Industrial Teaching Center (Centro de Enseñanza Técnico Industrial)	12	Bivalent Upper-secondary
UECYTM (CETMAR and CETAC)	5	Technical Professional
DGETA (CBTA, CBTF)	18	Bivalent Upper-secondary
CECyTE'S. Scientific and Technological Studies' Center in the States (Centros de Estudios Científicos y Tecnológicos en los Estados)	48	Bivalent Upper-secondary

Source: COSNET 1997.

Table A1.4. Goodness of fit using ENE 98, ENECE99, and 98 CONALEP Graduates

		Predicted Cases		*% Correct*
		Not CONALEP	CONALEP	
Observed	Not CONALEP	108,086	1,096	99.0
Cases	CONALEP	1,366	3,315	70.8

Independent variables included in the probit model to find the matching group (5 nearest neighbors and probability scores)

	Control Group	CONALEP
Education		
Technical complete with lower-secondary	81.4	81.2
Technical incomplete with lower-secondary	0.1	0.0
Technical complete with upper-secondary	12.4	12.6
University incomplete	4.9	4.8
University complete or more	1.2	1.4
Total	100.0	100.0
Sex		
Men	51.4	52.7
Women	48.6	47.3
Total	100.0	100.0
Age		
Mean	23.9	23.6
Median	23	23
Std. Deviation	4.7	4.6
Minimum	17	17
Maximum	53	53
Percentiles		
20	20	20
40	22	22
60	24	23
80	27	26
State		
Aguascalientes	4.8	2.4
Baja California	2.4	2.8
Coahuila	6.3	4.6
Chiapas	3.2	2.4
Chihuahua	1.6	1.5
Distrito Federal	5.6	4.7
Guanajuato	5.0	14.2
Guerrero	1.5	1.4
Hidalgo	2.7	3.8
Jalisco	6.8	3.4
México	12.6	15.2
Morelos	2.4	2.4
Nayarit	3.8	5.7
Nuevo León	5.1	3.9
Oaxaca	2.3	2.6
Puebla	4.1	4.5
Querétaro	2.7	1.7
Quintana Roo	1.6	1.4
San Luis Potosí	3.2	3.0
Sinaloa	3.8	5.2
Sonora	5.4	2.8
Tabasco	2.7	2.8
Tamaulipas	6.1	3.8
Veracruz	4.7	3.6
Total	100.0	100.0

Table A1.5 Goodness of fit using ENECE99

		Predicted Cases		*% Correct*
		Not CONALEP	CONALEP	
Observed	Not CONALEP	41180	772	98.16
Cases	CONALEP	574	4107	87.74

Independent variables included in the probit model to find the matching group (3 nearest neighbors and probability scores)

	Control Group	**CONALEP**
Education		
Technical complete with lower-secondary	78.7	76.5
Technical incomplete with lower-secondary	12.5	14.8
Technical complete with upper-secondary	6.3	6.6
University incomplete	2.4	2.0
University complete or more	100.0	100.0
Total		
Sex		
Men	52.6	52.9
Women	47.4	47.1
Total	100.0	100.0
Age		
Mean	24.4	24.2
Median	24	23
Std. Deviation	4.8	5.0
Minimum	17	17
Maximum	47	53
Percentiles		
20	20	21
40	22	22
60	25	24
80	28	27
Place of training		
Not training	63.0	61.4
Work	25.1	25.2
Other institution	11.9	13.4
	100.0	100.0

Independent variables included in the probit model to find the matching group (3 nearest neighbors and probability scores) cont.

		Control Group	CONALEP
State			
	Aguascalientes	3.7	1.5
	Baja California	0.1	
	Baja California Sur	3.3	1.5
	Coahuila	7.1	6.5
	Chiapas	2.9	3.2
	Chihuahua	1.7	2.7
	Distrito Federal	3.5	4.3
	Guanajuato	6.0	4.3
	Guerrero	1.2	0.6
	Hidalgo	2.1	7.9
	Jalisco	6.0	12.3
	México	11.7	11.8
	Morelos	2.9	0.9
	Nayarit	3.7	2.9
	Nuevo León	5.9	3.7
	Oaxaca	2.2	5.4
	Puebla	3.9	6.9
	Querétaro	2.8	2.4
	Quintana Roo	1.9	3.6
	San Luis Potosí	3.0	5.9
	Sinaloa	4.5	0.5
	Sonora	5.0	4.0
	Tabasco	2.3	2.7
	Tamaulipas	7.8	1.4
	Veracruz	4.8	2.9
		100.0	100.0

Table A1.6. Goodness of fit using ENECE99

		Predicted Cases		*% Correct*
		Not CONALEP	CONALEP	
Observed	Not CONALEP	41180	772	98.16
Cases	CONALEP	574	4107	87.74

Independent variables included in the probit model to find the matching group (5 nearest neighbours and probability scores)

	Control Group	**CONALEP**
Education		
Technical complete with lower-secondary	77.9	74.4
Technical complete with upper-secondary	12.5	17.1
University incomplete	7.3	5.7
University complete or more	2.2	2.8
Total	100.0	100.0
Sex		
Men	53.0	57.5
Women	47.0	42.5
Total	100.0	100.0
Age		
Mean	24.5	24.2
Median	24	23
Std. Deviation	4.8	5.1
Minimum	17	17
Maximum	46	53
Percentiles		
20	20	21
40	22	22
60	25	24
80	29	27
Place of training		
Not training	64.5	59.1
Work	24.1	25.1
Other institution	11.4	15.8

Independent Variables included in the probit model to find the matching group (5 nearest neighbours and probability scores) cont.

		Control Group	CONALEP
State			
	Aguascalientes	3.2	
	Baja California	0.1	
	Baja California Sur	3.1	1.5
	Campeche	0.0	
	Coahuila	6.6	6.3
	Chiapas	2.9	3.9
	Chihuahua	2.0	3.1
	Distrito Federal	3.4	3.7
	Guanajuato	7.0	5.3
	Guerrero	0.9	
	Hidalgo	2.0	11.2
	Jalisco	6.1	13.4
	México	10.5	11.4
	Morelos	3.1	0.6
	Nayarit	3.7	2.6
	Nuevo León	5.6	2.2
	Oaxaca	2.0	7.4
	Puebla	4.1	5.2
	Querétaro	2.9	0.6
	Quintana Roo	2.0	4.4
	San Luis Potosí	2.8	7.7
	Sinaloa	4.3	
	Sonora	6.4	4.2
	Tabasco	2.9	2.9
	Tamaulipas	7.2	1.1
	Veracruz	5.1	1.3
	Total	100.0	100.0

ANNEX 2

Table A2.1. Labor Force by Cohort
Matching group: Age 17-65. Five nearest neighbors based on propensity scores.

	Working			*Searching for a job*		
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 - 93	95.4	93.6	-1.8	4.6	6.4	1.8
91 - 94	95.0	93.4	-1.7	5.0	6.6	1.7
92 - 95	95.5	91.4	-4.1	4.5	8.6	4.1
93 - 96	94.1	90.4	-3.8	5.9	9.6	3.8
94 - 97	94.6	91.6	-3.0	5.4	8.4	3.0
Total[1]	94.9	92.1	-2.8	5.1	7.9	2.8
ENE 98[2]	97.5			2.5		
ENE 98, LS[3]	94.5			5.5		
ENE 98, US[4]	95.7			4.3		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.2. Labor Force by Cohort
Matching group: Age 17-65. Five nearest neighbors based on propensity scores.

	Working			*Searching for a job*		
Cohort	*Ctrl Group*	*CONALEP*	*Difference*	*Ctrl Group*	*CONALEP*	*Difference*
90 - 93	96.2	94.3	-1.9	3.8	5.7	1.9
91 - 94	93.4	90.9	-2.5	6.6	9.1	2.5
92 - 95	95.9	89.4	-6.5	4.1	10.6	6.5
93 - 96	95.6	87.7	-7.9	4.4	12.3	7.9
94 - 97	96.2	86.1	-10.1	3.8	13.9	10.1
Total[1]	95.4	89.9	-5.5	4.6	10.1	5.5
ENECE 99[2]	98.1			1.9		
ENECE 99, LS[3]	95.7			4.3		
ENECE 99, US[4]	98.4			1.6		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.3. Employment Status. Matching group: Age 17-65. Five nearest neighbors based on propensity.

	Employer			*Self employed*			*Employee*			*Cooperative membership*			*Worker without pay*		
Cohort	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 - 93	0.9	3.0	2.1	7.8	9.6	1.8	85.3	84.8	-0.4	0.0	0.0	0.0	6.0	2.5	-3.5
91 - 94	2.1	2.8	0.7	7.1	13.0	5.9	86.3	81.0	-5.3	0.0	0.5	0.5	4.6	2.8	-1.8
92 - 95	1.8	3.0	1.2	8.6	8.6	0.0	84.2	85.4	1.2	0.0	1.0	1.0	5.4	2.0	-3.4
93 - 96	2.1	4.3	2.2	7.1	9.6	2.5	87.0	83.2	-3.8	0.0	0.5	0.5	3.8	2.4	-1.4
94 - 97	1.0	1.1	0.1	7.4	7.1	-0.2	86.7	87.4	0.7	0.0	1.1	1.1	4.9	3.3	-1.6
Total[1]	1.6	2.9	1.3	7.6	9.7	2.1	85.9	84.2	-1.7	0.0	0.6	0.6	4.9	2.6	-2.3
ENE 98[2]	4.3			24.1			60.2			0.04			11.4		
ENE 98, LS[3]	0.2			4.8			77.9			0.02			17.1		
ENE 98, US[4]	2.5			11.0			77.8			0.00			8.7		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.4. Employment Status. Matching group: Age 17-65. Five nearest neighbors based on propensity.

	Employer			*Self-employed*			*Employee*			*Cooperative membership*			*Worker without pay*		
Cohort	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 - 93	1.0	4.1	3.2	7.7	15.5	7.8	85.6	79.4	-6.2	0.0	0.0	0.0	5.8	1.0	-4.7
91 - 94	3.3	2.8	-0.5	7.4	8.5	1.1	82.6	84.9	2.3	0.0	0.9	0.9	6.6	2.8	-3.8
92 - 95	0.8	2.8	2.0	6.6	10.3	3.7	86.9	86.0	-0.9	0.0	0.9	0.9	5.7	0.0	-5.7
93 - 96	1.8	6.3	4.5	10.5	5.2	-5.3	82.5	85.4	3.0	0.0	0.0	0.0	5.3	3.1	-2.1
94 - 97	0.0	0.0	0.0	6.3	9.4	3.0	84.8	85.9	1.1	0.0	1.6	1.6	8.9	3.1	-5.7
Total[1]	1.5	3.4	1.9	7.8	9.8	2.0	84.4	84.3	-0.2	0.0	0.6	0.6	6.3	1.9	-4.4
ENECE 99[2]	4.0			24.4			60.8			0.03			10.7		
ENECE 99, LS[3]	0.2			4.4			79.6			0.00			15.9		
ENECE 99, US[4]	2.9			9.2			81.4			0.02			6.5		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.5. Economic Sector. Matching group: Age 17-65. Five nearest neighbors based on propensity.

Cohort	*Agriculture, fishing, etc.*			*Extraction*			*Manufacturing*			*Construction*			*Electricity, gas, and water*		
	Control Group	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 – 93	2.8	0.5	-2.3	0.0	0.0	0.0	20.7	31.3	10.6	1.8	1.0	-0.8	0.9	1.0	0.1
91 – 94	2.1	2.7	0.7	0.4	0.5	0.0	20.3	30.9	10.6	3.3	2.3	-1.0	0.4	0.5	0.0
92 – 95	2.3	0.5	-1.7	0.0	1.0	1.0	23.0	34.0	11.0	2.7	3.0	0.3	0.0	0.5	0.5
93 – 96	0.8	0.0	-0.8	0.4	0.0	-0.4	25.2	30.4	5.2	3.4	4.9	1.5	0.4	0.5	0.1
94 – 97	2.0	1.1	-0.9	0.0	0.0	0.0	27.2	32.8	5.6	2.5	3.8	1.3	0.5	0.5	0.1
Total[1]	2.0	1.0	-1.0	0.2	0.3	0.1	23.2	31.8	8.6	2.8	3.0	0.2	0.4	0.6	0.2
ENE 98[2]	20.3			0.4			18.1			5.51			0.5		
ENE 98, LS[3]	17.0			0.1			31.8			4.57			0.2		
ENE 98, US[4]	6.3			0.5			19.7			2.22			1.3		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.5. (cont.)

Cohort	*Commerce, Restaurants, and Hotels*			*Transportation and Communications*			*Financial Services*			*Personnel, Common, and Social Services*		
	Control Group	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 – 93	27.2	24.7	-2.4	5.5	5.6	0.0	2.8	5.1	2.3	38.2	30.8	-7.4
91 – 94	28.2	26.4	-1.9	5.4	2.7	-2.7	2.1	1.8	-0.3	37.8	32.3	-5.5
92 – 95	28.8	23.9	-5.0	5.9	3.0	-2.8	3.2	3.6	0.4	34.2	30.5	-3.8
93 – 96	26.5	21.1	-5.4	4.6	1.5	-3.2	2.1	2.0	-0.1	36.6	39.7	3.2
94 – 97	23.8	23.0	-0.8	5.4	2.2	-3.3	1.0	2.7	1.7	37.6	33.9	-3.7
Total[1]	27.0	23.9	-3.1	5.4	3.0	-2.4	2.2	3.0	0.8	36.9	33.4	-3.4
ENE 98[2]	22.4			4.4			1.0			27.5		
ENE 98, LS[3]	26.0			3.6			0.2			16.5		
ENE 98, US[4]	31.6			8.1			2.9			27.6		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.6. Economic Sector. Matching group: Age 17-65. Five nearest neighbors based on propensity.

Cohort	*Agriculture, fishing, etc.*			*Extraction*			*Manufacturing*			*Construction*			*Electricity, gas, and water*		
	Control Group	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 – 93	1.9	0.0	-1.9	0.0	0.0	0.0	23.8	31.3	7.4	2.9	1.0	-1.8	0.0	2.1	2.1
91 – 94	3.1	0.9	-2.2	0.0	0.9	0.9	24.8	37.0	12.2	4.7	2.8	-1.9	2.3	0.9	-1.4
92 – 95	2.4	0.0	-2.4	0.8	0.9	0.1	21.3	26.2	4.9	3.1	1.9	-1.3	0.0	0.0	0.0
93 – 96	3.3	0.0	-3.3	0.0	0.0	0.0	21.5	33.7	12.2	5.0	3.2	-1.8	0.0	1.1	1.1
94 – 97	3.8	1.6	-2.2	0.0	0.0	0.0	25.3	32.8	7.5	1.3	4.7	3.4	0.0	0.0	0.0
Total[1]	2.9	0.4	-2.4	0.2	0.4	0.2	23.2	32.1	9.0	3.6	2.6	-1.0	0.5	0.9	0.3
ENECE 99[2]	21.0			0.3			18.8			5.53			0.5		
ENECE 99, LS[3]	17.2			0.1			30.5			4.71			0.1		
ENECE 99, US[4]	4.1			0.2			18.2			2.29			0.3		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.6. (cont.)

Cohort	*Commerce, Restaurants, and Hotels*			*Transportation and Communications*			*Financial Services*			*Personnel, Common, and Social Services*		
	Control Group	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 – 93	29.5	19.8	-9.7	4.8	4.2	-0.6	1.0	5.2	4.3	36.2	36.5	0.3
91 – 94	25.6	25.0	-0.6	5.4	5.6	0.1	2.3	1.9	-0.5	31.8	25.0	-6.8
92 – 95	28.3	27.1	-1.2	6.3	2.8	-3.5	2.4	4.7	2.3	35.4	36.4	1.0
93 – 96	29.8	24.2	-5.5	3.3	1.1	-2.3	0.8	1.1	0.2	36.4	35.8	-0.6
94 – 97	30.4	21.9	-8.5	3.8	3.1	-0.7	1.3	0.0	-1.3	34.2	35.9	1.8
Total[1]	28.5	23.8	-4.7	4.8	3.4	-1.4	1.6	2.8	1.2	34.8	33.6	-1.1
ENECE 99[2]	21.5			4.5			0.9			27.0		
ENECE 99, LS[3]	22.1			2.1			0.2			22.9		
ENECE 99, US[4]	32.8			8.8			2.9			30.5		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.7. Training
Matching group: Age 17-65. Five nearest neighbors based on propensity.

	Training			*Not training*		
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 - 93	35.8	49.0	13.2	64.2	51.0	-13.2
91 - 94	30.1	39.1	8.9	69.9	60.9	-8.9
92 - 95	42.2	46.4	4.2	57.8	53.6	-4.2
93 - 96	36.1	36.0	-0.1	63.9	64.0	0.1
94 - 97	34.1	31.3	-2.8	65.9	68.7	2.8
Total[1]	35.7	41.1	5.4	64.3	58.9	-5.4
ENECE 99[2]	22.1			77.9		
ENECE 99, LS[3]	12.1			87.9		
ENECE 99, US[4]	39.1			60.9		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.8. Relationship with Work
Matching group: Age 17-65. Five nearest neighbors based on propensity.

	YES			*NO*		
Cohort	*Ctrl. Group*	*CONALEP*	*Difference*	*Ctrl. Group*	*CONALEP*	*Difference*
90 - 93	92.3	93.9	1.6	7.7	6.1	-1.6
91 - 94	87.5	88.4	0.9	12.5	11.6	-0.9
92 - 95	85.5	84.3	-1.1	14.5	15.7	1.1
93 - 96	88.6	88.9	0.3	11.4	11.1	-0.3
94 - 97	82.1	85.0	2.9	17.9	15.0	-2.9
Total[1]	87.4	88.4	1.1	12.6	11.6	-1.1
ENECE 99[2]	86.1			13.9		
ENECE 99, LS[3]	74.2			25.8		
ENECE 99, US[4]	77.7			22.3		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.9. Reasons for Training. Matching group: Age 17-65. Five nearest neighbors based on propensity.

	Prerequisite for entering a job			*Update*			*Self-interest*			*He was asked to*			*Other*		
Cohort	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 – 93	10.3	2.0	-8.2	43.6	63.3	19.7	20.5	18.4	-2.1	20.5	8.2	-12.3	5.1	8.2	3.0
91 – 94	9.8	7.0	-2.8	36.6	58.1	21.6	17.1	18.6	1.5	31.7	9.3	-22.4	4.9	7.0	2.1
92 – 95	9.4	5.9	-3.6	35.8	56.9	21.0	24.5	21.6	-3.0	28.3	5.9	-22.4	1.9	9.8	7.9
93 – 96	8.9	19.4	10.6	35.6	55.6	20.0	20.0	8.3	-11.7	26.7	2.8	-23.9	8.9	13.9	5.0
94 – 97	7.7	15.0	7.3	34.6	40.0	5.4	30.8	30.0	-0.8	26.9	10.0	-16.9	0.0	5.0	5.0
Total[1]	9.3	8.5	-0.8	37.3	56.8	19.5	22.1	18.6	-3.5	27.0	7.0	-19.9	4.4	9.0	4.6
ENECE 99[2]	10.7			37.9			22.0			24.6			4.8		
ENECE 99, LS[3]	30.7			11.4			27.7			25.4			4.8		
ENECE 99, US[4]	13.9			27.2			27.5			26.9			4.5		

1. Sample: Labor force in the matching group.
2. Sample: Labor force.
3. Sample: Labor force with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Labor force with upper-secondary complete and 1-5 years of experience (22-26 years old).

Table A2.10. Average earnings, earnings per hour and hours worked by sample group

	Earnings			*Earnings per hour*			*Hours worked per week*		
Cohort	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 - 93	1924.7	2844.4	919.6	11.0	15.5	4.4	43.9	46.2	2.3
91 - 94	1984.2	2238.2	254.0	12.5	12.8	0.3	43.2	45.5	2.3
92 - 95	1898.5	2310.7	412.3	10.7	15.3	4.6	43.5	46.4	2.8
93 - 96	1992.9	2255.4	262.5	11.1	12.3	1.1	44.1	47.2	3.1
94 - 97	1749.5	1654.7	-94.9	9.4	10.1	0.7	45.0	44.3	-0.7
Total[1]	1914.1	2262.7	348.6	11.0	13.2	2.2	43.9	46.0	2.0
ENE 98[2]	2046.0			11.6			43.5		
ENE 98, LS[3]	1266.3			6.6			44.8		
ENE 98, US[4]	2088.5			11.2			45.8		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1 - 5 years of experience (22 - 26 years old).

Table A2.11. Average earnings, earnings per hour and hours worked by sample group

	Earnings			*Earnings per hour*			*Hours worked per week*		
Cohort	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*	*Control Group*	*CONALEP*	*Difference*
90 - 93	2047.0	3146.0	1099.0	11.4	16.6	5.2	44.0	45.6	1.5
91 - 94	2055.7	2397.8	342.1	11.5	13.8	2.3	44.2	46.8	2.5
92 - 95	2117.1	2872.7	755.6	12.0	16.7	4.7	43.8	45.0	1.2
93 - 96	1968.0	2181.0	213.0	11.0	11.2	0.2	45.1	47.6	2.5
94 - 97	1697.2	1750.9	53.7	9.5	12.1	2.6	44.8	46.0	1.2
Total[1]	2000.8	2528.8	527.9	11.2	14.3	3.0	44.4	46.2	1.8
ENECE 99[2]	1984.4			11.2			43.8		
ENECE 99, LS[3]	1253.1			6.6			44.8		
ENECE 99, US[4]	2142.2			11.4			46.0		

1. Sample: Workers in the matching group.
2. Sample: All workers.
3. Sample: Workers with lower-secondary complete and 3 years of experience (18 and 19 years old).
4. Sample: Workers with upper-secondary complete and 1 - 5 years of experience (22 - 26 years old).

ANNEX 3

Methodology

Models for Duration Data or Survival Analysis

The variable of interest in this duration analysis is the length of time to find a job after graduating from CONALEP, conditional on being unemployed or searching for a job. The functions of interest are the survival and the hazard function:

Survival function: $P\{T \geq t\}$

Hazard rate: $\lambda(t) = \lim_{\Delta \to \infty} \frac{P\{t \leq T \leq t + \Delta | T \geq t\}}{\Delta}$,

where: T is the random variable associated with survival time.

Kaplan Meier estimate of the survival function

Kaplan Meier is a strictly empirical approach (non-parametric), but it does not consider the influence of covariates. The estimators are given by:

$$\hat{S}(T_k) = \prod_{i=1}^{k} \frac{n_i - d_i}{n_i}$$

$$\hat{\lambda}(T_k) = \frac{d_i}{n_i},$$

where: n_k is the number of individuals whose observed duration is at least T_k, and d_k is the number of observed drop-outs at time T_k.

Cox Regression Model or Proportional Hazard Model

The Cox model allows exploration of the relationship between the survival experience of an individual and a set of explanatory variables or covariates. In this analysis, the hazard rate is the risk to find a job after being unemployed. The model specifies that the hazard is given by:

$$\lambda(t_i) = e^{\beta' \mathbf{X}_i} \lambda_0(t)$$

where:

$\lambda_0(t)$ is the baseline hazard, or the hazard for an individual with $\mathbf{X} = \mathbf{0}$.

$\mathbf{X}_i$ is the vector of explanatory variables for individual *i*.

$\mathbf{X}_i$ includes variables such age, gender, schooling, region, GPP.

The parameter estimates, $\hat{\beta}$; are obtained maximizing the partial likelihood.

The estimated survival function for the individual *i* is:

$$\hat{S}_i(t) = \left[\hat{S}_0(t)\right]^{\exp(\hat{\beta}' \mathbf{X}_i)}$$

where: $\hat{S}_0(t)$ is the estimated baseline survival function (for an individual with $\mathbf{X} = \mathbf{0}$).

The Cox regression model is semi-parametric because no particular probability distribution is assumed for the survival times, although the model is based on the assumption of proportional hazards. The adequacy of the fitted model was also tested throughout the residuals. Residuals were calculated for each individual in the sample. Their behavior is approximately known when the fitted model is satisfactory. A number of residuals have been proposed, among them the martingale residuals, which take values between - ∞ and 1; they have properties similar to those of linear regression, but they are not symmetrically distributed around zero. Another method that was used to verify the assumption of proportional hazards between the groups of interest was the Kaplan Meier estimate of the survival function for each group. For this estimate, we plotted $\log\left(\hat{H}(t_i)\right)$ against $\log(t_i)$ which yielded parallel curves across the different groups, thereby providing evidence that the assumption of proportional hazard was correct.

Multinomial Logit Model

The multinomial models estimated have a response variable with categorical outcomes 0, 1, 2, ..., J. In this analysis, these variables are status in the labor market and the type of occupation. The model also has K explanatory variables, $\mathrm{X}_i = [x_{i1}, x_{i2}, ..., x_{iK}]$ such as age, region, schooling, gender, cohort, and GDP. There are K parameters of the model for the outcome j, $\mathrm{B}^{(J)} = [\beta_1^{(J)}, \beta_2^{(J)}, ..., \beta_K^{(J)}]$. In the multinomial logit model, the set of coefficients $\mathrm{B}^{(0)}, \mathrm{B}^{(1)}, ... \mathrm{B}^{(J)}$ corresponding to each outcome category is estimated. Assuming that $\mathrm{B}^{(0)} = \mathbf{0}$, where $y = 0$ is the category base, the probability that the variable y takes the value "j" is:

$$P_i^{(0)} = P_i\{y = 0\} = \frac{1}{1 + \sum_{j=1}^{J} e^{\mathrm{X}_i \mathrm{B}^{(J)}}} \qquad (1)$$

$$P_i^{(J)} = P_i\{y = j\} = \frac{e^{\mathrm{X}_i \mathrm{B}^{(J)}}}{1 + \sum_{j=1}^{J} e^{\mathrm{X}_i \mathrm{B}^{(J)}}}, \qquad j=1, 2, ..., J$$

The above-estimated equations provide a set of probabilities for the J+1 choices faced by an individual with characteristics X_i. The marginal effects of the characteristics on the probabilities are obtained by differentiating (1):

$$ME_k^{(J)} = \frac{\partial P^{(J)}}{\partial X_k} = P^{(J)} \left[\beta_k^{(J)} - \sum_{j=0}^{J} P^{(J)} \beta_k^{(J)} \right] .$$

The marginal effect for a categorical explanatory variable k can be estimated by:

$$ME_k^{(J)} = \frac{\sum_{i=1}^{n} ME_{ik}^{(J)}}{n},$$

where:

$$ME_{ik}^{(J)} = P_i\{y = j | \mathrm{X}_i \text{ with } x_{ik} = 1\} - P_i\{y = j | \mathrm{X}_i \text{ with } x_{ik} = 0\} .$$

Hypotheses about coefficients were tested using a likelihood ratio test, which is based on the statistic: $\chi_c^2 = -2(L_a - L_o)$, which under Ho has the distribution $\chi^2_{(d_o - d_a)}$.

where:

L_o is the log-likelihood associated with the null hypothesis (constrained model).

L_a is the log-likelihood associated with the alternative hypothesis (full model).

d_o is the number of degrees of freedom for the constrained model.

d_a is the number of degrees of freedom for the full model.

ANNEX 4

Table A4.1. Cox Regression Model for Time to Find a Job After CONALEP

Variable	*Hazard Ratio*		*Std. Err.*	*Confidence Interval* *L*	*U*
98 Survey	1.45		0.15	1.2	1.8
Women	0.84		0.03	0.8	0.9
Age	0.99	*	0.00	1.0	1.0
South-East Area	1.22		0.08	1.1	1.4
Center-South Area	1.36		0.08	1.2	1.5
North-East Area	1.60		0.09	1.4	1.8
North-West Area	1.44		0.08	1.3	1.6
Center-North Area	1.45		0.08	1.3	1.6
Pacific Area	1.40		0.08	1.3	1.6
92 Cohort	1.00	*	0.11	0.8	1.2
93 Cohort	0.78		0.10	0.6	1.0
94 Cohort	0.61		0.12	0.4	0.9
96 Cohort	1.04	*	0.09	0.9	1.2
97 Cohort	0.90	*	0.18	0.6	1.3
Lower-secondary HH	0.95	*	0.04	0.9	1.0
Upper-secondary HH	0.99	*	0.06	0.9	1.1
University - + HH	1.09	*	0.10	0.9	1.3
Don't know HH	1.00	*	0.12	0.8	1.3
GDP per capita	1.17		0.07	1.0	1.3
Did not work when studying	0.82		0.03	0.8	0.9
No. of subjects =	4072				
No. of failures =	3781				
Log likelihood=	-28403.93				
LR chi2(2)=	294.67				
Prob > chi2 =	0.000				

Event (failure): To find a job. Censure: Not to find a job until survey time.
Base categories for covariates: 94 Survey, men, Center area (D.F. and Mexico), 91 cohort, none or primary school education of household head (HH). Graduate worked when studying at CONALEP.
Units for GDP thousands of 1998 pesos.
* Not significative at 5 percent

Table A4.2. Probability (Position in Occupation of CONALEP's Graduates). Marginal Effects Estimated.

Variable	Prob[*Position=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect	Variable	Prob[*Position=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect
j = Employer, self employed				*j = Employee*			
98 Survey	0.09	0.06	0.021	98 Survey	0.893	0.903	-0.010
Women	0.06	0.09	-0.029	Women	0.920	0.885	0.035
Age			0.002	Age			0.001
South-East Area	0.08	0.08	-0.001	South-East Area	0.89	0.90	-0.004
Center-South Area	0.10	0.08	0.024	Center-South Area	0.87	0.90	-0.029
North-East Area	0.03	0.09	-0.063	North-East Area	0.96	0.88	0.082
North-West Area	0.05	0.09	-0.035	North-West Area	0.94	0.89	0.049
Center-North Area	0.08	0.08	-0.006	Center-North Area	0.91	0.89	0.016
Pacific Area	0.08	0.08	-0.004	Pacific Area	0.90	0.89	0.009
Years after graduation			0.010	Years after graduation			-0.013
Not working when graduated	0.07	0.10	-0.037	Not working when graduated	0.91	0.87	0.047
Lower-secondary HH	0.08	0.08	-0.001	Lower-secondary HH	0.90	0.89	0.003
Upper-secondary HH	0.09	0.08	0.005	Upper-secondary HH	0.88	0.90	-0.020
University - + HH	0.11	0.08	0.035	University - + HH	0.87	0.90	-0.022
Don't know HH	0.11	0.08	0.027	Don't know HH	0.88	0.89	-0.015
GDP per capita			-0.001	GDP per capita			0.001

Base categories for independent variables: 94 Survey, men, Center area (D.F .and Mexico), working when graduated from CONALEP, none or primary school education of household head (HH). Units for GDP thousands of 1998 pesos.

Table A4.2. cont.

Variable	Prob[*Position=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect	Variable	Prob[*Position=j* | *X, dummy=k*] k=1 Survey 98	k=0 Survey 94	Marginal Effect
j = Cooperative's member				*j = Worker without payment*			
98 Survey	0.00	0.01	-0.009	98 Survey	0.02	0.02	-0.002
Women	0.01	0.01	-0.001	Women	0.01	0.02	-0.006
Age			0.000	Age			-0.003
South-East Area	0.01	0.01	0.003	South-East Area	0.02	0.02	0.002
Center-South Area	0.01	0.01	0.002	Center-South Area	0.02	0.02	0.002
North-East Area	0.00	0.01	-0.007	North-East Area	0.01	0.02	-0.011
North-West Area	0.00	0.01	-0.004	North-West Area	0.01	0.02	-0.011
Center-North Area	0.00	0.01	-0.006	Center-North Area	0.01	0.02	-0.004
Pacific Area	0.01	0.01	0.000	Pacific Area	0.01	0.02	-0.005
Years after graduation			0.000	Years after graduation			0.003
Not working when graduated	0.01	0.01	-0.002	Not working when graduated	0.01	0.02	-0.008
Lower-secondary HH	0.00	0.01	-0.003	Lower-secondary HH	0.02	0.02	0.001
Upper-secondary HH	0.01	0.01	0.003	Upper-secondary HH	0.03	0.02	0.012
University - + HH	0.00	0.01	-0.007	University - + HH	0.01	0.02	-0.006
Don't know HH	0.00	0.01	-0.007	Don't know HH	0.01	0.02	-0.006
GDP per capita			-0.001	GDP per capita			0.000

Base categories for independent variables: 94 Survey, men, Center area (D.F. and Mexico), working when graduated from CONALEP, none or primary school education of household head (HH). Units for GDP thousands of 1998 pesos.

Table A4.3. Regression Estimated Coefficients. Dependent Variable: Log(Earnings per hour)

Variable	*Coefficient*		*Std. Err.*	*T*	*P>|t|*	*Confidence Interval* *L*	*U*
98 Survey	-0.29		0.024	-11.9	0.00	-0.34	-0.24
Women	-0.10		0.019	-5.4	0.00	-0.14	-0.07
Age	0.01		0.002	6.3	0.00	0.01	0.02
South-East Area	-0.20		0.034	-5.9	0.00	-0.26	-0.13
Center-South Area	-0.08		0.031	-2.7	0.01	-0.14	-0.02
North-East Area	-0.04	*	0.029	-1.4	0.17	-0.10	0.02
North-West Area	-0.03	*	0.030	-0.9	0.36	-0.09	0.03
Center-North Area	-0.09		0.028	-3.2	0.00	-0.14	-0.03
Pacific Area	-0.05		0.029	-1.7	0.09	-0.10	0.01
Years after graduation	0.07	*	0.043	1.6	0.12	-0.02	0.15
Years after graduation^2	0.00	*	0.007	-0.5	0.62	-0.02	0.01
Lower-secondary HH	0.09		0.020	4.3	0.00	0.05	0.13
Upper-secondary HH	0.11		0.037	3.0	0.00	0.04	0.19
University - + HH	0.15		0.045	3.5	0.00	0.07	0.24
Don't know HH	-0.02	*	0.060	-0.3	0.77	-0.14	0.10
GDP per capita	-1.00		0.368	-2.7	0.01	-1.72	-0.28
Did not work when studying	-0.10		0.018	-5.5	0.00	-0.13	-0.06
Employee	-0.24		0.032	-7.4	0.00	-0.30	-0.18
Cooperative's member	0.04	*	0.111	0.4	0.69	-0.17	0.26
Worker without payment	-0.83		0.109	-7.6	0.00	-1.04	-0.61
Agriculture, fishing	-0.28		0.068	-4.1	0.00	-0.41	-0.14
Construction	-0.09		0.055	-1.7	0.10	-0.20	0.02
Commerce, rest., and hotels	-0.22		0.023	-9.6	0.00	-0.26	-0.18
Other activity sectors	-0.06		0.020	-2.7	0.01	-0.10	-0.02
Constant	6.19		1.391	4.5	0.00	3.47	8.92
Number of observations	4534						
F(25, 4508)	26.96						
Prob > F	0.00						
R^2	0.13						
Adjusted R^2	0.12						

Base categories for covariates: 94 Survey, men, Center area (D.F. and Mexico), none or primary school education of household head (HH), working when graduated from CONALEP, employer or self employed, manufacturing.
Units for GDP thousands of 1998 pesos.
* Not significative at 10 percent

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